American Journal of Public Health
and THE NATION'S HEALTH Vol. XIII No. 5

Volume XXI May, 1931 Number 5

Public Health Service—A Sound Investment*

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PUBLIC health work in America has developed with little regard to its cost or its value as an investment. It has grown primarily out of a generous desire to care for widespread illness and to check the spread of the more spectacular infectious diseases. Every epidemic of yellow fever, smallpox, and cholera, strengthened the limited powers of the health authorities. The activities they inaugurated were common sense reactions to the pressing needs of a dangerous situation. Later, esthetic considerations played their part. The growth of our cities demanded the removal of rubbish and of other wastes and this soon became a recognized function of many health departments. It was only in comparatively recent years that such activities as public health education, child hygiene, nursing, infectious disease control, and the other functions which constitute the routine of our best departments today, were added one by one; but even where the work has been most extensively organized, there has been very little recognition of the economic advantages accruing from this type of service.

No wonder then that the public health program has been extended in a halting fashion and has nowhere reached its full potentialities. The claims of health officers have not always been particularly convincing. There has been considerable hesitation about spending public funds on plans which often seemed tentative and experimental in character. To justify the widening scope of health service, it is intended in this paper to consider whether it is not, among other things,

* Presented at a General Session of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 30, 1930.

a sound business proposition. The time has now come when we can evaluate in monetary terms the claims of public health effort. Public health work can be justified very much as are other communal services such as the paving of our streets, the building of roads and the establishment of fire departments. These undertakings pay for themselves and bring a return more than sufficient to meet their cost. I propose to show that certain phases, at least, of the public health program are among the most profitable investments in which a community can place some of its funds. In fact, it is not difficult to prove that the financial returns are often out of all proportion to the cost of the effort, and justify much larger outlays than even the most progressive communities have made.

VALUES TO DEPENDENTS AND RELATIVES

Everyone will agree that human life has value, not only sentimental, but actual economic value. The view that men, women and children should be looked upon as community assets is rapidly spreading throughout the civilized world. Learned books have been written to show that human life in the aggregate is the community's greatest asset, far transcending material possessions of all kinds. There is, in the first place, good indication that human beings have economic value based on the fact that it costs a great deal of money to raise them to the point where they function as productive individuals. Parents ordinarily spend large sums of money to bring their children into the world, to feed, house, clothe, educate them, and to give them all the other things that are a necessary preparation for good citizenship. Having in mind that large group of people who constitute the average of our population, it costs about $10,000 in actual cash to provide even the very modest requirements of a growing child up to the age of 18. There are, of course, large numbers of children on whom much more is spent; but, broadly, one can consider $10,000 as a figure fairly representing the cost of bringing a child to maturity in the United States today.

Now it may be argued that money spent on an individual is no measure of his economic value, and perhaps a good case could be made out for that point of view. Parents spend money on their children not because they expect a good return on the investment, but because they love them and wish to serve them. After all, the best proof that human beings have economic value lies not so much in their cost but rather in their capacity to produce. We shall avoid debatable ground in attacking the question of the money value of human beings by considering them in their specific relationship to other individuals and on

this basis determine their value to their relatives. The commonest relationship is that of the breadwinner to a dependent wife and child. The average wage earner has very obvious money value to such dependents, and it is ordinarily a relatively simple problem to calculate the value of this wage earner to his dependents. It will depend upon the man's annual earnings and his age, for his age determines his probable after life-time.

Dr. Lotka and I, in our recent volume, *The Money Value of a Man,* have produced a series of tables which give the money value for persons of various earning capacities at different ages of life. For example, the money value to his family of a man 30 years old in the $2,500 income class is $31,000; for one in the $5,000 income class, it is nearer $50,000. In other words, it would take that much money put at interest at 3½ per cent to produce for a body of persons at a stated age, the total net income which they would earn for the rest of their natural lives. For those belonging to the higher income classes, the economic values to dependents are very much greater.

Such economic value of human beings to their dependents is well understood and is universally granted by the laws and our courts. Whenever an injury is done to an individual through the fault of another, he or his dependents can collect damages which bear some relation to his economic value. More and more, the courts are inclined to take into consideration authentic figures of economic value and make them the basis of awards, rather than leave the adjudication to sentiment or to the effect of eloquent pleas to juries. The main point here is that human beings, men, women, and children, have economic value as individuals—and in the aggregate such value transcends all other values. There is no greater asset in any community than the human beings who make it up. When some of them are destroyed or put out of action, the community thereby loses some of its wealth. When they are preserved and brought up to maturity with the least amount of wastage, the community profits and becomes enriched through the added productiveness of its citizens.

LEGAL ASPECTS

An interesting and instructive application of this principle that human life has money value is found in the legal cases now rapidly accumulating in which damages have been awarded against private companies and cities which have supplied drinking water that was polluted and hence responsible for typhoid fever cases and deaths. It is now a settled principle of law in the United States, confirmed by the Appellate Court in a case against the City of Albany, that a private com-

pany or a city acting as a corporate body which supplies water for human consumption must exercise every reasonable precaution to render it safe. If it is negligent in this obligation and injury results to a consumer, it may be sued for damages.

The first legal case on record, apparently, followed an epidemic of typhoid fever in Ashland, Wis., in 1893–1894 which was directly traced to an infected water supply. The widow of one of the victims brought suit against the water company and was awarded $5,000 damages. Even more famous in establishing this principle of law was the case of Keever vs. the City of Mankato, Minn., in which damages to the amount of $5,000 were awarded in 1910 against the city because of a typhoid fever death resulting from the pollution of the water supply. A number of similar cases have occurred since then; but on the whole these important precedents have received much less attention than they deserve from health officers.

In 1920, following a typhoid epidemic in Pittsburgh, Calif., the Supreme Court of that state awarded nearly $33,000 in damages to 19 plaintiffs who had suffered from the disease. The largest penalties on record are those against the City of Olean, N. Y., which two years ago suffered from an epidemic of typhoid fever in which 212 cases and 18 deaths occurred. It was necessary to vote a bond issue of $350,000 in order to pay the claims; and in 1930, this same city requested permission of the state legislature to issue bonds for an additional $75,000 in order to cover its losses.

It is true that these cases all center around the responsibility of the community to protect citizens from typhoid fever. To what extent is this principle of responsibility applicable to other situations in which the municipality has taken over the control of community needs? It is a fact recognized by everyone that in the complex life of our cities, the individual is quite unable to protect himself and his children against infection from a host of diseases and conditions. This is the justification and warrant for the health department. Consequently, the individual looks to the organization of his city or county to protect him. In so far as such obligations are assumed by the organized agencies of government, the question may well be asked whether injury resulting from neglect of such responsibility may not justify damages in the form of compensation to the injured parties. While there have been no such cases, and while there may be legal considerations which rule out such claims, it would seem that this possibility should be carefully considered. Once the principle of financial responsibility is widely established, public health work will be placed on a more permanent and secure basis than it has hitherto enjoyed.

PROGRESS IN HEALTH CONSERVATION

I raise these questions because they illustrate in dramatic form the thesis which I am elaborating, namely, that human life has great economic value and that public health work, as it has developed, has long been and is now becoming to an ever greater degree a conserver of such values. But long before the thesis that public health work may be regarded as a public investment was elaborated and before cases of damages occurred, proof had accumulated that the neglect of the public health was poor economy. The history of sanitary effort, as it has developed during the last 50 years, is replete with achievement. Though everyone is more or less familiar with the progress of the health conservation movement, it may be desirable to rehearse some of the principal public health activities which have resulted in a widespread reduction of sickness and of premature death.

First of all, typhoid fever has been almost completely controlled in the United States. It is but a short time ago that epidemics of this disease ravaged the countryside and took a heavy toll even in our large cities. As late as 1900, the death rate from this cause was 36 per 100,000 of population in the U. S. Registration Area, and it was unquestionably very much higher in the rural non-registration states. Each death represented at least 10 cases. Many readers are old enough to recall the epidemics of typhoid fever in Cincinnati, Philadelphia, and Pittsburgh, and any number of other communities, in which thousands of cases and hundreds of deaths occurred because the water supply was polluted and little or nothing was done to prevent the spread of the disease through secondary infection. It was perfectly clear that such conditions could not long continue if the cities were to grow and prosper as residential and business centers. Finally excellent water systems were installed in the larger cities and as a result of better supervision, and chlorination of water when necessary, the typhoid fever rate dropped in an amazing manner.

The death rate was only 5.5 per 100,000 in 1927; for the urban part of the population, it was only 3.0. In some communities like New York, where hundreds of millions of dollars were spent on the water system, barely a case of typhoid fever or a death which could be traced to the city's water supply has occurred in years. Because of its wise sanitary precautions the city, like so many others, has been enabled to grow to an extent consistent with its economic possibilities. Altogether, the experience has been so favorable that there is little danger at this time that any large community in the country will be tempted to skimp on the expenditure necessary to supply its citizens with plenty of good water. It does not require damage suits to prove

that this kind of public health work pays for itself and handsomely.

Other conditions have been attacked by the health authorities with similar success. The control of malaria is an excellent illustration of the large financial returns which have resulted from well conducted public health effort. This disease was until recently widespread over the southern states. It lay like a heavy weight on the country, sapping the energy of large populations and in certain areas rendering them virtually nonproductive. Then came the new technic for the study and eradication of the disease. This was launched largely under the direction of the public health movement and demonstrated not only that malaria could be controlled but that it cost a sum so small as to be out of all proportion to the value of the lives thus protected. Results of malaria campaigns are quickly discernible. In a number of demonstrations, the morbidity rates from malaria have been reduced to a third in the short period of two or three years.

The effort of the International Health Board of the Rockefeller Foundation in this field has been extremely significant. According to its reports, the usual methods of drainage, screening, and treatment of infected cases, may be carried out at a per capita cost of from $.45 to $1.00 a year. This amount is, of course, only a fraction of what is gained through the reduction of cases and the prevention of deaths. In fact, it is not too much to say that the campaign against malaria has resulted in a complete change in the economic and social life of large areas in our southern states. Many of the new industrial efforts, so characteristic of the new South, are entirely predicated on the elimination of malaria, as well as of typhoid fever and hookworm; the 3 scourges which have so heavily afflicted this part of the country.

Successful results have, likewise, attended the campaigns of health departments during the past 25 years to reduce infant mortality. By means of popular education and the service rendered in baby health stations, the mortality of infants has been reduced to less than half of what it used to be; so that now the infant mortality rate is under 7 per cent. There has been no greater contribution to the welfare of the community than the saving of this number of potentially valuable human lives; nor has this effort of the public health movement been limited to the first year of life. The same services have led to marked reductions in the mortality and morbidity of children in the preschool years from diarrhea and enteritis and other infections. The whole campaign of child welfare has been built around an attempt to safeguard the infant and to stimulate the growth of children into healthy and productive citizens. The child health campaign will on careful analysis be found to have paid for itself many times over.

A claim equally far-reaching can be made for the campaign to control tuberculosis. I need not recount all the efforts which have gone into this movement. The work has not been done by health officers alone; but it is to the everlasting credit of a few far-sighted public health authorities that the entire program was organized and other groups in the community were encouraged to aid the movement. Altogether, an amazing success has been achieved. In the short period of 30 years, the death rate from tuberculosis has been reduced to about one-third of what it was, and at present the rate of decline is faster than ever. The gains to the country economically and socially are incredibly large. Tuberculosis used to be one of the chief causes of poverty. Social workers were in the habit of tracing the origin of many of their relief cases to its ravages. Today, relatively few such cases come to their attention—other conditions now cause the trouble.

The more recent efforts of health departments also have important economic aspects. Less than a decade ago, they initiated a campaign to eradicate diphtheria, the intensive development of which goes back only three or four years. Already this disease is being erased from the list of community health problems. Active campaigns of immunization have been strikingly successful. In some cities, the current figures show a reduction of 50 per cent and more during the last year or two. The death rate which in 1910 was 21.4 per 100,000 of population in the registration area will this year probably be close to 5.0. Apparently, the complete elimination of diphtheria is only a matter of a few more years. All that is required is the effective routine of educating parents to immunize every young child.

I could refer to the promising efforts to reduce pneumonia, to the newer work against certain forms of heart disease, and the venereal diseases, all of which show real achievement and point to even greater success in the future. Possibly, however, the largest gains will come from the efforts of health departments to inculcate a new conception of personal health among the great mass of the people and to teach the lesson of preventing disease by keeping physically fit.

Whether the work is directed to the control of infection or takes the form of education, the result is pretty much the same. Life is being guarded from disease and premature death and life is being conserved on an enormous scale. We need only look back to the condition of 30 years ago when the death rate of the country was 17.6 per 1,000 annually. It was only 12.0 in 1928 and will be appreciably lower this year. This represents an immense annual saving of lives.

Possibly one may best appreciate the significance of this change by noting the extension in the average duration of life during the interval.

In 1901, the mean length of life at birth was 47 years for males and 50 for females. In 1927, the corresponding figures were 57.9 and 61.0, a gain of about 10 years for each sex. These gains are fortunately not mere additions to the period of useless old age, but rather represent years of activity and production achieved through eliminating much premature death.

ADVANTAGES TO THE COUNTRY

It is obvious that, human life being worth what it is, its saving on an immense scale has increased the wealth of the country. For example, the gain in expectation of 10 years during the interval since the beginning of the century means an increase in the money value of a man of well over $1,000. Under the conditions prevailing in 1901, a person of age 20 in the economic class in which the maximum annual earnings were $2,500 would have a money value to his dependents of $28,800. At the present time (that is, under current mortality conditions) a person at the same age would be worth $30,200. In other words, there is a gain of $1,400 in the value of an individual because of his longer productive lifetime. A similar gain is credited to each year of age up to age 30, and even at age 40 the greater life expectation means a gain of $550 an individual. In other words, when we prevent disease and postpone death, we are adding large and very tangible money values to the wealth of the community. Enormous gains to individual families and consequently to the nation result when public health activities function fully and effectively. There is every reason to believe that these gains have played a very large part in bringing about a higher standard of life and a more diffused prosperity to the people of the United States. Those who live longer, less harassed by preventable disease, can work more, produce more, pay larger taxes, and play an altogether more valuable part in the life of the nation.

I do not for a moment assume that all the lives saved and all of the cases of disease prevented have been due to public health activities. Other factors have undoubtedly played their part; but no one would deny that it is to the organized health agencies of the country, whether under public or private auspices, that we owe our greatest debt. It is particularly interesting that these health agencies have performed their services at a cost so small as to be almost negligible. It has always amazed me to see how minimal the figures are which have produced results so important to the national economy.

According to recent studies in a group of 183 cities, the average expenditures for public health work were highest in the largest cities. In those with 100,000 and more, the average health department ap-

propriation, exclusive of hospital care, was about $.62 per capita. In the cities between 30,000 and 100,000, the appropriation was $.525, and in those between 10,000 and 30,000, only $.47 per capita. These figures do not include the expenditures of the voluntary agencies.

In another group of 108 cities which were enrolled in the Health Conservation Contest launched by the Chamber of Commerce of the United States last year the per capita figures were somewhat higher. The average expenditure of the health departments in these cities was $1.03. In the 10 cities of over 500,000 population, the average was $1.15; in the 6 between 250,000 and 500,000, the average was $1.34. The highest expenditure was in the 16 cities between 100,000 and 250,000, with an average of $1.76 per capita. The cost of health service in the smaller cities varied from $1.03 to $1.22. These figures include the expenditures of the official health department, any health work of the board of education, and that of all voluntary health agencies, but do not include the cost of hospital care in any form.

Even the cities which carried off the highest awards in the contest showed extremely moderate expenditures. Thus, Milwaukee reported only $1.31 per capita last year, including the cost of public health service by private agencies; Syracuse, N. Y., a total of $3.05 for all expenditures; East Orange, N. J., $1.22; White Plains, N. Y., $2.75; and Sidney, O., $1.21. The average cost of all types of public health service in this group of 5 leading cities was only $1.75. In other words, about $1.50 represents the outlay in cities that have taken their health work seriously and are achieving worthwhile results. It is clear that by and large, the municipalities of the country are running well below this figure.

The costs in our rural areas are considerably lower than in our cities. Counties whose health work has attracted attention are spending little more than $1 per capita per annum and the general run is much less. Taken all in all, if we include all types of public health service, official and private, local as well as state and federal, the annual figure will be considerably under $1 per capita for the people of the United States; but even if we should assume an average of $1 per capita in order to play absolutely safe, the total for public health work would reach only a little over 120 million dollars per year for the entire country.

This sum is small indeed when we consider the number of lives at stake and their enormous money value. Obviously there is a great disproportion between the two accounts which we are balancing, namely, of outlay and of savings. That is why it is suggested that public health activities, when well conducted, are among the most de-

sirable and profitable of public investments. In many respects, these efforts are only beginning. The pitifully small amounts expended for health service in so many cities and in the rural areas of the country show how backward we are in making available to all people the benefits of present knowledge. Practice and application lag far behind what we now know very well how to do. While it is true that the general death rate has been reduced to a very low point, there are still close to 100,000 deaths a year from tuberculosis. I am confident that three-quarters of these could be postponed for shorter or longer periods. There are large areas in the country where little or nothing has as yet been done to cope with the tuberculosis problem.

When our present knowledge regarding the care of certain types of pneumonia is put into operation on a large scale, we should succeed in reducing the number of deaths from this disease by one-third to one-half. Pediatricians agree that deaths from diphtheria can be virtually eliminated and those from diarrhea reduced to one-quarter of the present number. All but 5 per cent of the remaining typhoid cases can be prevented. Safety engineers are very confident of their ability to reduce by a quarter the number of accidents in industry, in our homes, and on our highways.

The great problem still remains how best to prevent and treat the ailments of middle life, namely, heart disease, Bright's disease and cerebral hemorrhage; but even here progress is being made. Information as to the causes leading to these degenerative conditions is increasing. It is not too much to expect that a perceptible proportion of deaths can be postponed for a time at least.

For these reasons, I estimate that the expectation of life can be increased by more than 5 years provided the knowledge now available be utilized by health organizations, public and private. The expectation of life in the country as a whole can be extended to a span of at least 65 years. This is not an idle dream for it has virtually been done in far-away New Zealand. Progress will go considerably beyond this point; exactly how far, will depend upon new discoveries in preventive medicine in our laboratories and clinics.

The vital question is whether the American people are really in earnest about expanding the public health program and in proving its effectiveness. It will be necessary, of course, to strengthen the facilities of health departments, to build up more efficient organizations, train health workers better, make their tenure of office safer, pay them more adequate salaries, and develop a more professional spirit among them. This will necessitate larger expenditures. But so small is the amount spent at present that there should be no difficulty in

obtaining increased funds in a country as rich as the United States.

Our best authority, Professor Winslow of the Yale School of Public Health, has estimated that an expenditure of only $2.50 per capita for health service will provide all of the activities of a well rounded program. Other authorities and experience attest to the soundness of this estimate. Health appropriations should, however, remain flexible. Where there are special difficulties to overcome, as in malarial regions or where special racial groups present health problems requiring additional services, the per capita figure should be higher; but taken by and large, an expenditure of $2.50 per capita for the country as a whole, including the rural areas, will be found adequate. This moderate sum will provide all the facilities that can profitably be used at present. As additional knowledge becomes available and health departments can safely extend their operations into new fields, the amounts may be somewhat increased. At any rate, the figure given is sufficient to maintain the best current practice. A total expenditure of 30 million dollars for the public health service of the entire nation, or about 180 million dollars more than is now being spent, is all that is necessary.

I need not stress the insignificance of the amounts now expended for public health service. As a nation, we have learned how to spend money freely for things inconsequential as compared with public health. We are notorious for our large outlays for luxuries of every character. Our annual candy bill has been estimated as high as 690 million dollars; perfumes and cosmetics consume another half billion, and our tobacco bill is rapidly approaching the 2 billion dollar mark, if it has not already passed this point. In a country like ours, there should be no great difficulty in making available soon the small sum which if put into the hands of our health authorities would give them the power to reduce sickness and prevent death as far as our present knowledge permits.

I am very optimistic over the prospect of achieving this ideal. The business men of the country are already waking up to the fact that it is to their interest to further the public health campaigns. They realize that a good health record is a business asset for a city and they advertise this widely in their effort to attract industries, conventions, and the travelling public. Possibly, no more significant event has taken place in recent public health history than the entry of the Chamber of Commerce of the United States into a close alliance with the American Public Health Association. The launching of the City Health Conservation Contests is really an accomplishment of the first importance.

Already in 200 cities, local chambers of commerce are interested and are coöperating actively with their local health officers and the public to make possible improvements of all kinds in the health service. This active interest of the business men should make a profound difference in the amounts appropriated for local health service. I hope it will not be long before 500, yes even 1,000 cities, will enter the contest and make the good natured rivalry among them a national institution. There is no better way to direct the attention of the public to the importance of their health service. When this has been achieved, it will not be necessary to prove that expenditures for public health service are a sound investment. The results will be evident to all who wish to see.

Physicians per Capita

ACCORDING to a report prepared under the direction of Dr. Willard C. Rappleye, the United States has 1 physician to every 800 persons, a larger number in proportion than any other representative country in the world. Other countries come as follows: Switzerland, 1,250; Denmark, 1,430; England and Wales, 1,490; Germany, 1,560; France, 1,690; The Netherlands, 1,820; and Sweden, 2,860.

There is tremendous pressure by would-be students on all medical schools for admission, which would indicate that more facilities for medical students are needed, but the real basis for such a decision should be judged by the need of the country for physicians and the extent to which facilities at present meet that need.

There are 66 approved 4-year medical schools in this country which graduated about the same number of physicians in 1930 as the 131 schools then existing did in 1910.

Perhaps the most heartening finding is the fact that each year shows a larger number of applicants who have completed more than the minimal requirements for admission than the medical schools can accommodate. The most recent figures show that 50 per cent of the students applying for admission to medical schools have completed a full college course. Many take combined academic and medical courses which give them the bachelor's degree at the end of the first or second year of medicine. Of those graduating in 1930, 70 per cent had the bachelor's degree, compared with 24 per cent in 1920, and 15 per cent in 1910.—*United States Daily*, Mar. 16, 1931.

Differentiation of the Species of the Genus Brucella*

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THE differentiation of the known species or varieties of Brucella and the mechanism of their behavior which serves to separate one from the other continue to be one of the important problems occupying the minds of those who are engaged in studying this group of microparasites and the reactions which they elicit from the host. It is now known that there are three species in the genus: *Brucella melitensis* (Bruce), *Brucella abortus* (Bang), and *Brucella suis* (Traum). The accumulating data indicate that they invade and produce disturbances in the tissues of as many species of animals as any other known pathogenic microbe. The desirability of being able to identify them with certainty is therefore obvious.

It is imperative that a satisfactory method or methods be available to determine if a strain coming from one species of host is entirely different from a strain coming from another. It is also important to know whether each of the species of Brucella is confined to one particular host or may have several hosts. This is especially important from the standpoint of human infections if their source is to be established more definitely. At present it appears to be established that one species of Brucella is common to the goat, one to the cow, and one to the hog, but this does not imply that each is confined always to a single host. It may occasionally be found in a variety of hosts. In the past, a strain recovered from the goat was called *melitensis,* if from the cow it was called *abortus,* if from the hog it was also called *abortus.* Yet, those from the hog were isolated under aerobic conditions and considered more pathogenic for guinea pigs than the strain common to cattle.

The fact that a given strain comes from a cow, a hog or a goat is not conclusive proof that it is *abortus, suis* or *melitensis.* Not until hundreds of strains from different animals in different countries have

* Read before the Laboratory Section of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 30, 1930.

been studied with respect to their individual peculiarities, if such exist, will the relationship of Brucella to different hosts be known.

During recent years there have been no less than 10 methods proposed for the differentiation of the species of Brucella. Most of these have dealt with only 2 of the species, *Br. abortus* (Bang), and *Br. melitensis* (Bruce). Most of these have been thoroughly discussed before. Recently, 2 more methods of distinguishing *abortus* from *melitensis* have been proposed. One, by Favilli,[1] is based on the difference in the viability of the two on a semi-solid culture medium, and the other, by Valenti,[2] on the bactericidal action of homologous serums coming from individuals who have recovered from undulant fever.

The first would appear to possess too great a degree of uncertainty; yet, cultures identified by Favilli in this manner and later sent to the writer for confirmation by other methods were found to be in agreement. The second, that of Valenti, appears to be valueless. We have not been successful in our efforts to confirm his findings. As a matter of fact, we have labored for 2 years to obtain a serum possessing bactericidal properties for Brucella and our efforts have been negative.

The McAlpine and Slanetz[3] method, based on differences in the glucose metabolism of Brucella, is satisfactory for identifying *Br. abortus,* but it does not with a certainty distinguish *Br. melitensis* from *Br. suis.*

The differential method which has received the greatest amount of attention is that of agglutinin adsorption. This is uniformly valuable in distinguishing *Br. melitensis* from *Br. abortus,* but the usual technic employed does not distinguish *Br. suis* from *Br. abortus.* Henry[4] states that if R strains of *Br. suis* are used as antigen, this species may be distinguished from *Br. abortus.*

The value of any method for distinguishing closely related species of microörganisms lies in the ease and accuracy with which it can be employed and the consistency of results, even after the organism has undergone physical changes such as from an anaerobic to an aerobic state and variations in agglutinability. When more than one species occurs in infective material, such as blood or feces from cases of undulant fever, and milk or aborted fetuses from infected cattle, the differential method should tell us this fact, and further should separate one from the other. It should also find useful application in keeping laboratory cultures correctly identified.

There is another angle to the differentiation of strains of Brucella from humans alone which is assuming economic importance. This applies to those people in industries who when ill are entitled to disability compensation under the Workmen's Compensation Act if it can be

shown that the disability was acquired in the line of occupation. For example, if a worker contracts undulant fever while employed in an industry which involves the handling of animals, let us say hogs, and he seeks disability compensation, he will find that before his claim is approved, it will either be necessary for him to prove that he handled carcasses infected with Brucella, which will be impossible owing to the lapse of time between exposure and the onset of symptoms, or that the strain with which he is infected is the one common to hogs. In addition he will also have to produce proof that he has not been working with other animals or has not used raw products from cows. This is not a theoretical example. Several cases of this nature have already been brought up where it was necessary to bring forth evidence to prove that the disability, undulant fever, was contracted in line of duty.

It is firmly believed that the method [10] discussed below, which the writer has studied for the past 4 years, possesses all of the qualifications which one would desire for differentiating organisms within a genus. It is based on the growth inhibiting or bacteriostatic action of certain dyes when introduced into a medium suitable for the growth of Brucella. It has been employed in studying 656 strains of Brucella as to species. These strains were isolated from cattle, hogs, horses, goats, fowls, and humans, and came from all parts of North America, Europe and Africa.

It has been necessary to make slight changes in the technic, not because the method was faulty but to overcome possible discrepancies which seem to have had the faculty of creeping in as the study progressed. Many criticisms have been raised concerning the accuracy of the method. Some are justifiable, and it has been necessary to study and answer those. We have learned that dyes of certain manufacturers are not suitable for this technic; also, that only beef liver infusion agar of the correct formula gives accurate results. We also know that through long exposure or the incubation of plates containing the dyes in a room where there are reducing gases present, such as a 37° C. incubator, the dyes are reduced and their bacteriostatic action is impaired. The lower the concentration of a dye or the more it is reduced, the less effect will it have in inhibiting the growth of Brucella.

The differentiation method has been based on the employment of such dyes as thionin and either methyl violet or basic fuchsin. Thionin in a suitable final dilution completely inhibits the growth of *Br. abortus*, but not that of *Br. melitensis* or *Br. suis*. Methyl violet or basic fuchsin in a suitable final dilution will completely inhibit the

growth of *Br. suis* for 72 hours, but only slightly reduce the growth of *Br. melitensis* or *Br. abortus*.

In using thionin, it is important that the 1 per cent aqueous stock solution be thoroughly shaken just before it is placed in the medium, because the dye does not make a very stable solution in water. This is also true of basic fuchsin. If too long a time intervenes between shaking and placing it in the medium, the final concentration will be too low, and satisfactory inhibition of growth will not be obtained. The most satisfactory final dilution for thionin is 1–30,000, and for basic fuchsin 1–25,000.

We have also sought and found a dye possessing more uniform and constant bacteriostatic action against *Br. suis* than any of those of the triphenylmethan series. This dye is formo-rhodamine hydrochloride, commonly known as pyronin. Pyronin is soluble, and when made up in a 1 per cent aqueous stock solution, is stable. The final dilution which should obtain for completely inhibiting all strains of *Br. suis* is 1–200,000. By using different final dilutions of pyronin it is quite satisfactory for separating each of the 3 species. A final dilution of 1–100,000 permits only a slight growth of *Br. melitensis,* while all strains of *Br. abortus* give a luxuriant growth at this dilution. The stock solutions of all the dyes spoken of should be prepared by sterilizing the distilled water and dye powder separately before putting them together.

TABLE I

THE SOURCE AND CLASSIFICATION OF THE SPECIES OF BRUCELLA ACCORDING TO BEHAVIOR TOWARD DYES

Source	Number of Strains	Species		
		Br. melitensis	*Br. abortus*	*Br. suis*
Human	236	73	67	96
Bovine	263	4	249	10
Porcine	55	0	0	55
Caprine	35	35	0	0
Equine	16	0	11	5
Avian	2	0	2	0
Unknown	49	21	23	5
Total	656	133	352	171

Thus far, the dye method of distinguishing the species of Brucella has been extended to 656 strains* isolated from man and animals in

* Since the presentation of this paper a strain of *Br. suis* has been isolated from the testicle of a dog sent to this laboratory by Drs. Case and Planz of Akron, O.

continental Europe, Great Britain, Africa, Maltese Islands and North America (Table I). The strains of *Br. melitensis* from man and the goat were, for the most part, isolated in European countries. It is of interest to note that the goat has not yielded any strains of the other 2 species of Brucella. The 4 bovine strains of *Br. melitensis* were isolated from cattle in the United States and Switzerland. The 67 human strains of *Br. abortus* were from cases of undulant fever in the United States, Rhodesia and north European countries such as Denmark, Germany, and Sweden. The 11 equine strains of *Br. abortus* were, with 2 exceptions, isolated from cases of fistula of the withers in horses and mares by Dr. C. P. Fitch* of the University of Minnesota and Dr. Van der Hoeden* of Utrecht, Holland. The 2 avian strains of abortus were from fowls in naturally infected flocks in the State of Michigan. The 96 strains of *Br. suis* were from cases of undulant fever occurring in the United States. No cases of undulant fever in any European country have thus far yielded a culture of *Br. suis*. The bovine, porcine, and equine strains of *Br. suis* were isolated in the United States. It would appear that hogs are refractory to infection by *Br. abortus* since not a single strain from this source has come into the hands of the writer. The 49 unknown strains were sent to the laboratory without any history. Many of these were isolated several years ago and had passed through several laboratories before reaching ours.

DISCUSSION

If the method of identifying the species of Brucella according to their behavior toward dyes is correct, it would seem that one can no longer doubt that *Br. abortus* is one of the causes of undulant fever in America and north European countries. This method substantiates the epidemiological data collected by students of the disease here and abroad.

The comparative pathogenicity of *Br. abortus* and *Br. suis* for man has been based largely on the number of successful recoveries of each in blood cultures. It is a well known fact that numerous cultures have been taken in cases of the disease with negative results. It has also been demonstrated that *Br. suis* can be obtained in culture from the blood with a greater percentage of success than can *Br. abortus*. Therefore, it is perfectly evident that at present one cannot say that *Br. suis* is the predominating species in undulant fever in America just because a greater number of isolations have been obtained. If *Br. abortus* is as pathogenic for man as the epidemiological and laboratory findings indicate, there is still to be answered the important question which has been raised many times: Why is the number of cases of

undulant fever due to *Br. abortus* so out of proportion to the number of individuals that have been exposed to infective material?

It is a well known fact that, of the thousands who take *Br. abortus* into their bodies when they consume infective raw milk or cream, a very small proportion develop undulant fever. The failure of many to become infected may be attributed to a native immunity to Brucella. Another hypothesis that has been advanced for the low incidence of infection as compared with the numerous exposures is gradually becoming a reality. Favilli[7] first offered the suggestion that there might be a wide difference in the virulence of strains of *Br. abortus* and that possibly only a certain strain was pathogenic for man. Meyer and Eddie[8] also made the same suggestion based on their difference in pathogenicity for monkeys.

We have observed that strains of *Br. abortus* differ markedly in their ability to reduce basic fuchsin in beef liver agar. Those that have been studied appear to divide themselves into 2 groups: one, when grown on plates of the dye medium for 72 hours, produces a zone of complete decolorization, which extends outward and around the growth to a distance of 5 to 15 mm.; the other, grown for the same length of time, produces only a slight decolorization. This difference in dye reducing ability is true of newly isolated CO_2 anaerobic strains as well as older aerobic ones. It has also been observed that those strains which decolorize the dye slightly rarely, if ever, produce the abundant growth that is produced by the intensely decolorizing ones. The interesting feature about the 2 groups is that those strains which are not active reducers of basic fuchsin appear to come from humans and cattle, while those that completely reduce the dye come only from cattle. About 80 per cent of the strains from cattle that have been studied belong to the latter group.

One of the problems that has interested us in connection with the study of the behavior of Brucella toward dyes and which we have spent considerable time in trying to solve, is the nature of the bacteriostatic reaction. Our data (to be presented in detail later) show that Brucella possesses a very active reducing system which operates on the food in the medium to make it available for the metabolism of the cell. The activity of the reducing system varies with the species of Brucella. When these particular dyes are added to the medium, they combine with the food, thus preventing or retarding its reduction, and prevent or retard the natural metabolism of the cell. In order for Brucella to grow, its reducing system must affect one or more of the dyes. *Br. suis* possesses a very actively reducing system for thionin, but not for fuchsin or pyronin. *Br. abortus* is able to reduce fuchsin and pyronin,

but not thionin in certain concentrations. *Br. melitensis* can reduce each of the dyes in question. Its reducing activity, however, is lower for pyronin than is that of *Br. abortus*. If one artificially maintains the dyes in a reduced state in the medium, there will be no inhibition of the growth of any Brucella.

Besides the identification of the species of Brucella, the dye method, combined with the determination of the activity of H_2S metabolism, plays an important rôle in separating two species when accidentally mixed or when they occur together in a single blood culture from a case of undulant fever. Dr. Borts, of the Iowa State Board of Health Laboratories, has twice separated from a blood culture *Br. abortus* and *Br. suis* and once *Br. abortus* and *Br. melitensis* by use of the dye method.

They are also useful in separating Brucella from bacteria of another genus that appear like Brucella in their morphological and cultural characteristics and cross agglutinability. One particular organism which the writer has in mind, and which could easily be confused with *Br. suis,* is *Pfeifferella mallei.* The natural host of this organism is the horse. So also is *Br. suis* sometimes found in the horse. The lesions produced in the guinea pig by both organisms through subcutaneous or intraperitoneal inoculation are not entirely unlike in character. Both attack the same organs, producing large necrotic abscesses, and cause abscess formation of the joints of the extremities. *P. mallei* is agglutinated by serum prepared against *Br. suis,* and *Br. suis* is agglutinated by a *P. mallei* antiserum. The reducing activity of *P. mallei* for dyes differs from that of *Br. suis* in that it gives a luxuriant growth on a medium in the presence of either thionin, basic fuchsin or pyronin. *P. mallei* is also a very active H_2S producer. This gas is produced in large amounts over a period of 10 to 15 days' incubation as determined by lead acetate paper. *Br. suis* produces very little H_2S after the 4th day of incubation. Cultures of supposed Brucella or *P. mallei* from horses should be examined very carefully by laboratory methods in order to avoid an erroneous classification which later might be disastrous.

The dyes which inhibit the growth of Brucella are now being found suitable as therapeutic agents for the successful treatment of undulant fever. Leavell, Poston and Amoss[8] have found that the daily oral administration of small doses of the dyes brings about a complete recovery in chronic or resistant cases. Thionin is administered when *Br. abortus* is involved and methyl violet when *Br. suis* is the infecting species.

Pyronin should prove even of more value as a therapeutic agent

than the two dyes just mentioned because in low dilutions it is effective against all three species, and, if given slowly, it may be injected intravenously in a 1 per cent solution without harmful effects. Monkeys easily tolerate from 10 to 20 c.c. by the intravenous route.

SUMMARY

A total of 656 strains of Brucella from Europe and North America have been studied in their growth behavior toward aniline dyes in a suitable medium.

It has been found that these strains divide themselves into 3 groups or species according to the growth inhibiting action of thionin in a final dilution of 1–30,000, and pyronin in a final dilution of 1–200,000 in beef liver infusion agar at a pH of 6.6.

Of the total number, 133 have been classified as *Br. melitensis* (Bruce), 352 as *Br. abortus* (Bang), and 172 as *Br. suis* (Traum). *Br. melitensis* grows on both the thionin and pyronin dye medium, while *Br. abortus* grows only on the one containing pyronin and *Br. suis* only on the one containing thionin.

The strains of *Br. abortus* may be divided into 2 classes: those which completely reduce basic fuchsin (final dilution 1–25,000 in beef liver infusion agar), and those which slightly reduce this dye. It appears, on the basis of isolated cultures, that the latter class is the one that is pathogenic for man.

When more than one species of Brucella occurs in blood culture or other infective material, the dye method and H_2S metabolism determination will separate and identify each of the species.

The growth inhibiting action of these dyes, especially pyronin, offers possibilities in the therapeusis of undulant fever in man and Brucella infections in animals.

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NOTE: This work was aided by a grant from the committee on infectious abortion of the National Research Council and the Bureau of Animal Industry of the U. S. Department of Agriculture.

Agglutinins for Br. abortus in the Blood and Milk of Cows*

Use of the Agglutination Reaction in the Control of Certified Milk

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THE American Association of Medical Milk Commissions has in its regulations the statement that "No cow known or suspected to be diseased shall be permitted to remain in the milking herd." Acting under this regulation, the Wayne County Medical Milk Commission agreed to a tentative procedure in an effort to exclude from production of certified milk all animals which were to any degree likely to convey the organisms of undulant fever to the consumer.

The blood agglutination test with a *Br. abortus* antigen has been used for some time as a means of excluding possibly dangerous animals. The presence of agglutinins in the blood cannot be regarded as satisfactory evidence of active infection. While exclusion of producing cows on the basis of this test would certainly be a safe procedure, it would seem to be entirely too rigid a criterion for practical purposes. On the other hand, the actual isolation of bacteria of the *Br. abortus* group from the milk of each animal is impractical from the standpoint of a control laboratory, not only because of the laborious and time consuming technical procedure but also because negative findings would be of little value. The procedure agreed upon as worth a trial was to exclude from milk production those animals in which both the blood serum and the milk serum contained agglutinins for *Br. abortus*.

In order to obtain some data in regard to this requirement, during the past year both blood and milk reaction tests have been made on all cows producing certified milk on the five farms supplying Detroit.† To obtain more data on animals giving a positive blood test, 250 such cows on Farm A are included, although the milk is not part of the certified supply.

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* Read before the Laboratory Section of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 30, 1930.

† The laboratory work was done by James G. Thomas and Marguerite Novy.

The samples of blood were collected, allowed to clot and the serum removed in the usual manner. The milk samples were collected from each quarter of the udder separately, rennet added and the serum removed after transportation to the laboratory. At least 3 blood and 2 milk tests were made on each animal. The agglutination test was performed with Huddleson's antigen and the technic followed was that of Huddleson's rapid method, using the following serum dilutions: 1–25, 1–50, 1–100, 1–200, and 1–500. As a tentative procedure, serums showing agglutination in a 1–100 dilution or higher are recorded as positive, those showing agglutination in 1–25 or 1–50 are recorded as positive-negative and those showing no agglutination as negative.

The results of agglutination tests for each of the five farms are given in Table I. The practice at Farm A has already been referred to. At Farm B, Huddleson's non-agglutinating vaccine was being used during the period of the tests. The cows on Farm C had been vaccinated with a non-virulent agglutinating vaccine from 6 to 18 months before the samples were collected. On Farm E many more blood reactors were obtained than are shown in the table, but these animals were immediately disposed of and were not available for milk tests.

TABLE I

AGGLUTINATION OF BR. ABORTUS BY BLOOD AND MILK SERUMS

Farm A		Farm B		Farm C		Farm D		Farm E	
Blood	Milk	Blood	Milk	Blood	Milk	Blood	Milk	Blood	Milk
	+ 36		+ 3		+ 10		+ 2		+ 0
+ 71	± 6	+ 9	± 1	+ 43	± 3	+ 9	± 0	+ 4	± 0
	— 29		— 5		— 30		— 7		— 4
	+ 0		+ 0		+ 0		+ 1		+ 1
± 43	± 0	± 4	± 1	± 43	± 0	± 14	± 1	± 11	± 1
	— 43		— 3		— 43		— 12		— 9
	+ 0		+ 1		+ 0		+ 0		+ 0
— 193	± 0	— 81	± 0	— 32	± 0	— 26	± 0	— 64	± 1
	— 193		— 80		— 32		— 26		— 63

Six hundred and forty-seven cows were examined. Of these, 396 or 61.2 per cent were non-reactors to the blood serum test; 115 or 17.8 per cent gave an agglutination in serum dilutions of 1–25 or 1–50; 136 or 21.0 per cent agglutinated the antigen in a dilution of 1–100 or higher; 579 or 89.5 per cent gave no reaction in the milk serum at any time from any quarter of the udder. The milk serum from 14 or 2.2 per cent agglutinated the antigen in a dilution of 1–25 or 1–50 in one or more quarters at some time; 54 or 8.3 per cent showed agglutination in dilutions of 1–100 or higher. Since these gross figures are of relatively little importance, all the data have been separated so as to show

the number of positive or negative bloods giving positive or negative milk reactions. In Table II the results are combined and summarized. Of the cows showing no blood reaction 99.5 per cent gave no milk reaction; 95.7 per cent of the reactors in low dilutions (1–25 or 1–50) gave negative milk tests. For practical purposes it would appear that if a blood serum agglutination test is negative or positive with a serum dilution less than 1–100, the chances are small of obtaining a positive milk reaction. The exact significance, however, must depend upon ability to isolate *Br. abortus* from the milk.

TABLE II

SUMMARY OF AGGLUTINATION TESTS
647 COWS

	Blood								
	+			±			−		
Number	136			115			396		
Per cent	21.0			17.8			61.2		
	Milk								
	+	±	−	+	±	−	+	±	−
Number	51	10	75	2	3	110	1	1	394
Per cent	37.5	7.3	55.2	1.7	2.6	95.7	0.25	0.25	99.5

Of the 136 blood reactors, 55.2 per cent gave no milk reaction; 7.3 per cent gave a reaction only in dilutions of 1–25 or 1–50; while the remaining 37.5 per cent were distinctively positive. Here also the significance of the negative milk reaction must be checked by further bacteriological data.

It is essential that the quarters of the udder be tested separately, since dilution might mask a positive test in one quarter. This possibility is indicated by the following data: the results of 100 laboratory tests showing at least 1 positive reaction in milk from the 4 quarters were picked at random. Of these, 26 were positive in 1 quarter only, 23 in 2 quarters, 17 in 3 quarters and 34 in all 4 quarters.

It is particularly desirable that all animals be tested after freshening (15 to 30 days). There were many instances where a negative reactor changed to a positive within a month after calving. Blood and milk serum tests during gestation are of relatively little value. A careful history of each animal is essential to proper interpretation of the reactions obtained in the laboratory.

That a positive blood test alone does not indicate active abortus infection is shown by the fact that many cows in this group have never aborted. Records over a period of several years were available on one of the farms.

Another fact noted was the rapid change in the milk serum agglutinin content in some animals. The antibodies may disappear completely in a few weeks, or a negative animal may become positive in the same time.

The following procedure is recommended as a practical control measure in connection with the production of certified milk.

1. A blood serum agglutination test with a *Br. abortus* antigen is made (a) on all producing cows twice a year, and (b) on all cows between the 15th and 30th day after freshening.
2. Samples of milk from each quarter separately are taken from all animals giving a positive reaction in blood serum dilutions of 1–100 or higher.
3. Animals showing any agglutinins in the milk serum from any quarter of the udder are immediately excluded from the producing herd.
4. The excluded animals are re-tested one month later, and if still positive are isolated from the certified barns.

NOTE: This work was done in the Detroit Department of Health. We are indebted to Michigan State College for some of the data here presented and to the several farms for their active coöperation.

Thus Saith the Lord

THE effort to promote and preserve public health by the pronouncement of edicts by or under authority of sovereign power is of ancient origin.

The ten commands of God respecting moral and civil obligations, written on tablets of stone and given by Moses to the children of Israel, are not older in time than that code of sanitary regulations for the preservation of the health and safety of the people, minute and particular in every detail, wherein God, through Moses, commanded his people to observe frequent purifications and cleansings; to isolate those suffering from communicable diseases; to disinfect houses where the plague had prevailed; to destroy infected articles; to avoid the use of unwholesome foods; and to protect the roofs of their houses by battlements, "that thou bring not blood upon thine house if any man fall from thence."—

(*Public Health and Safety*, by Parker and Worthington. Albany, N. Y., 1892, Matthew Bender, p. 37)—*Pub. Health Rep.*, Mar. 20, 1931, p. 632.

Public Health Control of Infectious Abortion in Certified Milk*

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HISTORICALLY the control of the Brucella infections as applied to certified dairies was initiated and subjected to careful tests by a series of developments which have been recognized during the past 15 years.

It has always been the opinion of those interested in the certified milk problems that for practical purposes this article of food as produced under the regulations for certification was a safe raw milk. However, it must be emphasized, and the fact credited to the sincerity of the certified milk movement, that when suggestions began to be offered and the efficiency of the control as well as the safety of the product questioned, groups of workers began to investigate the foundations on which the whole principle was based.

The Commissions, cognizant of their responsibility, always felt that within certain limitations a dependable safeguard had been erected by a rigid system of dairy hygiene. One weak link in the chain, emanating from the cattle themselves, existed in the diseases to which man is heir. At first tuberculosis played a leading rôle, then the streptococcic infections, and finally, through the observations of Fleischner and Meyer in 1915, the significance of the infectious abortion in certified herds was recognized. The original observation that certified milk may harbor the representatives of the Brucella group was made as early as August, 1915. Strain No. 80, now well known and extensively used for serologic tests, and in recent years designated as a *Brucella abortus suis*, was isolated at that time.

No effort was spared by the two workers mentioned to secure clinical or epidemiological evidence relative to the infectiousness of the certified milk consumed during 1915 and 1916. Since these inquiries were entirely negative and the trend of the prevailing discussion clearly indicated the lack of sufficient proof to incriminate the bacterium as

* Read before the Laboratory Section of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 30, 1930.

harmful to man, the Milk Commissions decided to take an expectant attitude. However, the feeling of the members was clearly expressed in the conclusions which Fleischner and Meyer presented before the 68th session of the American Medical Association in 1917. They said: (1) For practical purposes *Brucella abortus* is always present in certified milk produced in the San Francisco Bay region; (2) it is of greatest importance to study the abortus problem from every angle to be absolutely certain of its bearing on the health of infants.

A study was made of 75 infants fed for from 1 to 12 months on a raw milk containing a large number of *Bacillus abortus,* and later supplemented by a group of 200 children in the age class 0 to 5 (unpublished data). Their serums were subjected to agglutination tests with negative results. With 2 exceptions, negative cutaneous allergic tests were also recorded. The 2 positive tests were in children suffering from bone tuberculosis of long standing and, in view of available knowledge at that time, were interpreted as nonspecific co-reactions due to general sensitization with tuberculo-protein.

Fleischner and Meyer introduced the intradermal tests not only in the diagnosis of animal infections in order to distinguish tuberculous infections from those caused by the Brucella organism, but also as an aid in the recognition of human infections due to the latter bacteria. Reports in the Italian and French literature at that time indicated that the customary serologic tests might be inconclusive in chronic or mild subclinical infections.

Since a diligent search over 2 years for acute Brucella infections in children had failed to reveal such conditions, it was reasonable to suspect that the disease existed, if at all, in the subclinical or immune stage and could probably be recognized by means of allergic tests. Unfortunately two important facts were not considered: (1) The past history of undulant fever was not carefully analyzed; the brilliant treatises of Hughes,[11] Cantaloube[2] and Eyre[6] were superficially read and consequently it was not realized that the age group 0 to 5 in countries north of the 45th latitude possesses a very high immunity against this infection; (2) the nature of the "abortin reaction" was incompletely understood, consequently the evidence adduced from the clinical, serological and allergic studies was considered suggestive that *Brucella abortus* (bovinus) is non-pathogenic for infants and children.

Irrespective of the negative findings in 1917 and 1918 it was deemed important to approach the solution of the question in the mind of the Milk Commissions: "Is the *Bacillus abortus* discharged in the milk of dairy cattle infectious for man?" by various investigative routes. A few of the contemplated studies were completed. How-

ever, it was of considerable significance that in the course of a comparative analysis of a series of cultures, a Brucella strain originally isolated from a human patient in Austria was found to behave, culturally and serologically, like a *Br. abortus bovis*. Furthermore, feeding experiments on monkeys left no doubt that the Brucella organisms isolated from cow's milk, when administered by mouth in sufficiently large dosage, are pathogenic for these animals.

In 1919 the entire evidence was carefully analyzed, and it was pointed out that future bacteriological work might reveal a strain of *Br. abortus* which, in relation to its invasive properties, approached *Br. melitensis* more closely than those studied. A search for such a strain or strains was planned, but one member of the San Francisco Milk Commission (K. F. M.) was obliged to devote his entire attention to another problem of food sanitation and discontinued his studies on the Brucella group for 7 years. The San Francisco Milk Commission continued to take a great interest in the reports which gradually established a causal relationship between bovine abortion disease and undulant fever in man.*

In 1921 Bevan[1] reported the development of undulant fever in a number of human beings in Rhodesia, none of whom had consumed goat's milk. The evidence pointing to cattle as a source of infection was circumstantial, although subsequent tests by Orpen[13] showed these cases to be caused by the abortus type of the Brucella. Promptly, from widely separated parts of the world and the United States, cases were reported which were in all probability caused by organisms from bovine sources. By the end of 1925 the observations of Keefer,[12] Evans,[5] Carpenter,[3] Huddleson,[10] and others strongly indicated that the *Br. abortus* infections may assume an important public health aspect. The San Francisco Milk Commission was particularly alarmed by a case reported by Dickson.[4] †

No cases of undulant fever were recognized in California during 1926. However, the American Association of Medical Milk Commissions invited Drs. George H. Hart and Earle M. Dobbs of the University of California to discuss at the Twentieth Annual Conference at Dallas, Tex., April 20, 1926, the relation of *B. abortus* to public health. The authors concluded that the few cases of undulant fever reported in various parts of the world, including 12 in the United States which

* During the most critical years the San Francisco Commission seriously missed the counsel of Dr. E. C. Fleischner, whose untimely death doubtless deferred the organization of drastic control measures until 1927.

† A woman who had not been in contact either with goats or cattle was advised to consume 5 to 6 glasses of milk daily. She developed undulant fever with a positive agglutination test in a dilution of 1:500. Epidemiological studies showed that part of the milk consumed had been raw and abortus organisms were isolated from 2 cows in the dairy.

could not be traced to goats, were, in the light of the work done by well known investigators, cases of bovine origin.

The views expressed were fully shared by the Milk Commissions of the State of California and forcibly expressed at a meeting of the State Association in December, 1926. In fact, plans were discussed with Dr. C. M. Haring and members of the Division of Veterinary Science of the College of Agriculture, University of California, to apply to the certified dairies the system of control of Bang's disease so effectively administered since 1924 in a herd at a State Hospital.*

A number of developments during the first quarter of 1927 crystallized into a definite plan of procedure. In January, 1927, the Hooper Foundation was requested to examine a specimen of blood serum from a patient living at Morenci, Ariz. The serological study indicated an infection with *Br. melitensis*. Two cultures subsequently forwarded confirmed the diagnosis. In March another specimen of serum was forwarded from Los Angeles. The absorption test suggested an infection with the abortus variety. In the course of the next 8 weeks, 6 other specimens of blood serum of a series of 17 gave definite agglutination reactions with the abortus variety. These findings aroused tremendous interest, particularly since all the patients denied any contact with goats or goats' milk products. On the other hand it was claimed that all had consumed during the past 6 or 8 months large amounts of raw cows' milk. An attempt was made to determine the sources of the milk and the same number of dairies as there were patients were found to have furnished it.

The Commissions promptly recognized the significance of these scattered cases and, although no infections had been connected with the certified milk supply of the large cities, a serological survey covering the extent of brucelliasis of the dairies was ordered. The tests were made in April, 1927, and approximately 20 per cent of the milch cows were thus found to give positive reactions indicative of an active past or latent but stationary herd infection. Market milk supplies of two dairies were tested on guinea pigs. They demonstrated the presence of *Br. abortus* in both specimens. The owners were instructed to proceed under the direction of the Division of Veterinary Science with the control of the infection by the segregation method.

Due consideration was given to these recommendations in the draft of the revised requirements of the California State Association of Certified Milk Commissions (Alameda, Los Angeles and San Francisco Counties) adopted late in 1927 and put in effect January, 1928.

* For details the reader is referred to *Circular 44*, California Agricultural Extension Service (Fred M. Hayes, Bang's Disease), University of California, 1930, pp. 17–24.

Paragraph 42 of the requirements which specify the control of Bang's disease reads:

> After July 1, 1930, only animals free from *Brucella abortus* infections shall be permitted in a certified dairy, or to come in contact with any animal in a certified herd. The agglutination test of the blood serum shall be used for the determination of latent infections or carriers. The tests are only recognized by the Commissions when conducted by or under the supervision of the Commission's veterinarian. No animal shall be added to a certified herd until it has been tested for abortion disease by the Commission's veterinarian.*

The dairies complied with the requirements, but since the Commission for economic reasons desired to control the disease gradually over a period of a year and a half, several hundred reacting animals were removed when opportunities occurred to dispose of them. This prevented replacement by purchase and thus obviated conditions which in the long run would have jeopardized seriously the ultimate eradication of the infection. Irrespective of the defects inherent in a system of segregation in the dairy the number of reactors in the 4 certified herds was reduced as follows in 1928:

TABLE I

Herd No.	Av. No. Animals	Per cent	Periods
1	323	7.7	Jan., 1928
"	"	0.6	Dec., 1928
2	430	17.9	May, 1928
"	"	0.5	Dec., 1928
3	218	6.0	Jan., 1928
"	"	0.5	Dec., 1928
4	82	2.2	Jan., 1928
"	"	1.3*	Dec., 1928

* No effort made to remove reactors promptly.

The preliminary control work favored a prompt response and by May, 1928, the serum tests revealed 2 herds without a single reactor while the 2 others showed 1 and 2 respectively. The eradicative measures were very strict and the reactors were promptly removed from the farms. The histories of the herds for the year 1929 and the first half of 1930 are shown in Table II.

In order to verify the effectiveness of the control measures and as an additional check on the serum tests, the Division of Veterinary Science began a procedure which must be considered an important step toward the assurance of the Commissions and the consumer that certified milk is free from *Br. abortus*. This test, previously used in other states to recognize Brucella shedders in vaccinated herds, was intro-

* Repeated tests are now required.

TABLE II

Herd	Dates of tests and percentage of reactors in total number of animals tested							
	February 1929	March 1929	April 1929	May 1929	June 1929	August 1929	October 1929	November 1929
1	356 0.5%	—	—	304 0%	293 0%	—	—	—
2	—	436 *0.4%*	—	—	419 *0.2%*	451 *0.2%*	—	417 *0.4%*
3	—	—	—	215 0%	—	—	—	198 0%
4	—	—	202 1.4%	—	—	178 1.1%	214 0%	—

Herd	Dates of tests and percentage of reactors in total number of animals tested						
	January 1930	February 1930	April 1930	May 1930	June 1930	July 1930	August 1930
1	330 0%	2	—	—	258 0%	—	—
2	404 *0.2%*	419 0.2%	427 0%	409 0%	454 0%	—	—
3	—	—	—	253 0.4%	209 1.0%	210 0%	—
4	—	212 0%	—	—	211 0.4%	—	138 0%

duced into the routine tests of the dairies in the San Francisco Bay region. Since October, 1929, and every 30 to 60 days thereafter samples of certified market milk from each dairy have been collected and guinea pigs injected with the cream and sediment. The results have been negative with 1 exception.

It will be noted in Table II that Herd 3 suddenly revealed, in May, 1930, 1, and in June, 2 reactors. The blood serum of the cow detected in May, 1930, agglutinated in a dilution of 1:3,200; her milk serum reacted with the abortus antigen in a dilution of 1:100. She was one of the milking string of 50 cows. A sample of milk of this dairy bought in the open market was tested on guinea pigs. Typical abortus infections resulted. Additional guinea pigs were injected with market milk samples after removal of the cow. They revealed no lesions. The udder secretion of the reactor cow contained abortus organisms.

The actual dilution of this infected milk in the positive market sample is not known. From a practical point of view this is not necessary since the observation conclusively demonstrates the contamination of the milk supply by one animal. Absolute freedom from reactors is therefore an indispensable prerequisite for a certified milk.

In this connection it may be of interest to consider the sources of infection of the animals in Herd 3. A canal separates the farm from one which maintains a large dairy herd of which about 300 are infected with Bang's disease. The irrigation ditches for both farms lead from this canal and the possibility exists that water is the carrier. Large flocks of crows inhabit this territory. Frequently these birds feed upon aborted fetuses and placentas on the one farm and fly across the canal to the barn yard and feed racks of the certified dairy. There may be other sources of infection but either of the above may serve as the carrier. It is obvious that a certified dairy in the vicinity of a large reservoir of infection requires continuous and vigilant supervision.

The magnitude of the problems involved in the eradication of brucelliasis is apparent when one considers the work and results obtained by the Los Angeles Milk Commission. Control measures were instituted in 1927. An initial survey in July of 3,071 animals revealed 38.2 per cent reactors distributed through 5 dairy herds. A system of segregation and replacement by purchase was instituted. Progress in the control program was at first quite rapid, and by 1929 the tests revealed approximately 1.7 per cent reactors. Only those who are familiar with the size of dairy herds in Southern California will appreciate that the producers of certified milk willingly assume a gigantic task in replacing in a very short time as many as 400 reactors on 1 farm. One should therefore not underestimate the disorganization and expense (cost of 16,000 serum tests in 6 months) entailed in the eradication of Bang's disease from large dairies. Formerly self-containing units entirely dependent on replacement by raising were forced to

TABLE III

Serum Test	Date	Per cent Reactors
First	July–August, 1927	38.2
Second	November–December, 1927	10.7
Third	February–March, 1928	5.4
Fourth	August–September, 1928	5.4
Fifth	December, 1928–January, 1929	2.8
Sixth	April–May, 1929	1.7

search the country for suitable milch cows free from disease. That they succeeded in some measure is illustrated by the data (Table III) which the President, Dr. Fitch C. E. Mattison, presented at the An-

nual Conference of the American Association of Medical Milk Commissions at Montreal, 1929.

Late in 1929 the Commission organized and now supports with the aid of the producers a well equipped laboratory entirely devoted to the medical and veterinary supervision of the products of the certified dairies in the Los Angeles district. Systematically the cows are tested at 30- to 60-day intervals. Market samples of each dairy are collected every week and guinea pigs injected with the cream and sediment of a specimen of 80 c.c. The work is conducted by Drs. C. W. Bonynge and J. P. Bushong.

The low incidence of reactors was unfortunately not maintained, largely because of the replacements by purchase. Although the herds were invariably stocked with negative reactors, animals with latent infections were probably introduced and the incidence of reactors rose from approximately 1 to 6.4 per cent. Consequently it was not surprising to encounter guinea pigs with definite abortus lesions. In general the anatomical, cultural, and serological findings were indicative of infections with few organisms, and the presence of abortus bacilli was irregular.

The analysis of the information thus far collected by the two Commissions suggests the following conclusions: (1) The eradication of Bang's disease in large dairies dependent for replacement of the reactors by purchase is a slow process; (2) the mixed market milk from such herds continues to harbor abortus bacilli in small numbers until the percentage of reactors is below 1 per cent; (3) although epidemiological investigations during the past 6 months, and serum tests on children who consumed this milk have failed to reveal undulant fever infections, it is the earnest desire of the Commissions to press vigorously the control measures until the number of the reactors is reduced to zero; (4) by comparison it is evident that herds in which no attempts are made to eradicate Bang's disease, and the percentage of reactors is large, unquestionably furnish a milk heavily infected with abortus bacteria; (5) certified herds which are subject to reinfection from neighboring herds and those which depend upon replacements by purchase must be subjected indefinitely to serum tests at intervals of from 30 to 40 days; (6) the Commissions should certify only milk which is free from abortus bacteria as shown by repeated guinea pig tests, preferably made at weekly intervals. Only cows known to be non-reactors to the agglutination tests furnish such milk.

Independent of the pioneering work done on the Pacific, the American Association of Medical Milk Commissions has discussed the public health aspect of Bang's disease at every annual meeting since 1925.

As a national organization devoted to the production of the highest quality milk, a great responsibility had to be assumed in deciding a matter which presented many controversial aspects. Two facts invariably deferred immediate action to compel the producers of certified milk to eradicate Bang's disease from their herds:

First, epidemiological studies had shown that although the majority of cases of undulant fever gave a history of having consumed raw milk, there remained a fairly large percentage in which other contacts with the Brucella organism were evident. In certain sections of this vast country, abortus fever is an occupational and not merely a milk-borne disease. The careful investigations of Kristensen and Holm definitely indicate that one-third of the 500 cases investigated in Denmark may be attributed to milk.

Second, it remains a noteworthy fact that great reluctance continues to be expressed in offering final conclusions and a solution for this complex problem. As late as 1929, Theobald Smith" made the significant statement: "As to active measures against undulant fever, if it should be made fairly clear that the bovine race of *Br. abortus* is the real source of the other races then the time would be ripe for an active campaign against it."

It was therefore felt that adequate safeguards either in the form of pasteurization or elimination of the Brucella carrier in the herd must be instituted as soon as the actual rôle played by milk is definitely established. The papers read by Drs. I. F. Huddleson and J. G. McAlpine in 1928 before the Twenty-second Annual Conference at Minneapolis and the review presented by Dr. J. G. Hardenbergh before the Metropolitan Certified Milk Producers Inc. in February, 1928, amply testify to the trend of the deliberations. Furthermore, the presidential address read at the 1929 meeting of the American Association of Medical Milk Commissions at Montreal emphasizes the earnestness with which the entire problem was approached.

The speed with which the eradication of Bang's disease is to be undertaken was left largely to the discretion of the County Milk Commissions. However, a circular inquiry made during September, 1929, by the secretary of the association disclosed the fact that plans to eradicate Bang's disease in certified dairies all over the country were well under way. Some of the results reported were: 102 farms answered; 85 tested or tests under way; farms supplying milk from 100 per cent negative animals: 42, or 49 per cent; from 75–90 per cent negative animals: 15, or 17 per cent; from 66 per cent negative animals: 6, or 8 per cent; from less than 66 per cent, or not stated: 22, or 26 per cent.

It has been estimated that by the middle of 1930 approximately 80 per cent of the certified dairies were actively engaged in a program of eradication of Bang's disease. The procedures in vogue were blood tests every 60 to 90 days, segregation, disposal of reactors or suspects, cleanliness and disinfection, replacements by animals which gave negative tests. To the astonishment of everybody concerned, it was noted that 6 farms used vaccines. In one instance the producer tried to determine the degree of the herd infection by serum tests. Of 50 animals reported, 28 reacted positively, 20 suspiciously and only 2 were negative. In order to accelerate the control of Brucella infections in certified dairies the National Association adopted, June, 1930, the following rules pertaining to the control of Brucella infections:

It is required that elimination of Bang's abortion disease be actively prosecuted to the end that this disease be eradicated as early as possible from certified herds.

(a) No animal shall be used in the production of certified milk that shows positive evidence of infection with Brucella organisms.

(b) Herds shall be under the supervision of such agencies as shall be acceptable to the State Livestock Sanitary authorities and to the local Milk Commission.

As already mentioned the execution of the methods and standards is left to the County Milk Commissions. The National Association will try to collect reliable data regarding the progress of the control work and will doubtless publish from time to time the results or failures noted.

From the foregoing review of the trend of the various Milk Commissions toward the elimination of Bang's disease ir the herds under their supervision it is evident that the entire problem has been approached with the facilities made available by those who have been engaged in this work for the past 5 years. Probably for many of the certified dairies the principles are not practical and the Commission will have to work out special procedures. For example, the important problem of the most economic disposal of the reactors requires some unified plan of action. To offer these animals for sale and thus to disperse them all over the country presents a great menace to the dairy industry.

In most cases the reacting cows represent valuable breeders which are eagerly sought by unscrupulous dealers to build up new herds. In order to prevent such dangerous practices the Commissions should insist that the reactors be segregated on separate farms far removed from the certified herd. The milk of these animals must be pasteurized, while the isolated herd may be used for the rearing of heifers free from abortion disease.*

* For details see *Circular 33*, California Agricultural Extension Service, College of Agriculture, University of California, 1929.

One is frequently asked: What results can be expected if the program of eradication is completely carried out? Since a great many factors in the epizoölogy of brucelliasis and the epidemiology of undulant fever in man are still unknown, any statement would probably be contradicted by new facts discovered in the future. However, two possibilities should be considered:

First—The control and eradicative measures now practised in many communities on a purely voluntary basis, although quite successful, may require legal enforcement. As an alternative, the cooperative plan known as the "Pennsylvania plan" may be adopted. Isolated farms free from Bang's disease contain highly susceptible animals, and when surrounded by infected herds are subject to catastrophic losses. Against such a possibility the certified dairy must protect itself by continuous serum tests at 30-day intervals. Until the dairy industry as a whole embarks on a plan to control Bang's disease, the position of the Brucella-free dairy will remain precarious and the efforts of the Commissions thus be nullified.

Second—Experience with regard to the elimination of Bang's disease by the segregation or eradication methods in certified dairies is based largely on the observations of livestock sanitarians throughout the United States. In California neither energy nor expense has been spared. With an unbiased mind the task has been undertaken and it is anticipated that it will be carried out successfully. The next 12 months will show if the milk of certified dairies can be kept free from Brucella organisms. Every effort will be made to keep the clean herds free from the disease. If the desired goal cannot be reached, then public health interests may remain assured that the Milk Commissions will be the first to introduce pasteurization of the milk under their care. In anticipation of such a possibility the American Association of Medical Milk Commissions appointed, in 1929, a Committee on Scientific Research, which will concern itself with approving, advising or actually directing certain research projects of importance to the dairy industry.

One of the principal projects, aside from the Brucella infections, which has occupied the attention of the committee deals with the study of the physical, chemical, nutritive, and bacteriological characters of milk as influenced by age, heat, cold, aeration, or exposure to various gases, radiation, contact with metals, etc. The necessity for such fundamental studies was admirably detailed by Dr. M. J. Rosenau at the Detroit Conference of the Milk Commissions. These studies, which would extend over a term of years, would then be followed by the second phase of investigation: a comparative study of the various

methods of commercial pasteurization and commercial pasteurizing machinery. Since the Medical Milk Commissions promote the production of milk of highest quality the pasteurization cannot be solely viewed as a safety factor, but the effect of heat on the nutritive factors in milk and many other conditions must be more definitely understood than hitherto.

Nobody will question the great benefits derived from pasteurization. However, the sanitarian and the consuming public are entitled to expect that the methods and supervisory control will be superior to those now generally in vogue should pasteurization of certified milk be undertaken.

With the knowledge now available the Commissions are left in a quandary as to the kind of equipment to be used in an individual or cooperative plant, the time and temperature, the extent of the supervision, and other matters. In fact, it would be very difficult at present to draft a set of regulations. Years of fundamental research are required. It is therefore hoped that in the meantime Bang's disease may have been banished from the certified dairies and that the problems which face the Commissions may be less serious.

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Further Studies on Brucella abortus in Certified Milk*

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IN a previous study of the certified milk sold in the city of Detroit it was found possible to detect, by plating methods, *Br. abortus* in the milk from 3 of 5 herds studied.[1] Two hundred and thirty samples of certified milk were collected and plated from December, 1928, to September, 1929, in an attempt to isolate members of the Brucella group. These samples were taken from bottles ready for delivery and were plated when at about the same age as milk reaching the consumer—from 30 to 48 hours old. *Br. abortus* was isolated from 10 of the 230 samples, the positive samples being obtained from but 3 of the 5 herds studied. Of the positive samples, an average of 2 organisms per c.c. was found, the highest count being 8.

Since September, 1929, steps have been taken by the Medical Milk Commission and public health authorities of Detroit to eliminate from these herds all animals which, on the basis of serological tests, were considered to be infected with *Br. abortus*.

This study was undertaken to answer the question: "Do animals which give negative serological tests excrete *Br. abortus* in their milk?"

The work consisted of an examination of the milk from each quarter of the udders of all animals composing the 5 certified herds producing milk for the city of Detroit. This included a bacteriological study by plating methods to isolate organisms of the Brucella group, and a serological study of *Br. abortus* agglutinins present in the milk serum. Records of blood serum agglutination on these animals were available through the courtesy of the Board of Health and owners of the herds, from which all data on blood serology were taken.

The specimens were taken from April, 1930, to August, 1930. Samples from each quarter, in separate sterile tubes, were immediately taken to the laboratory and examined. One-half c.c. of milk from each was placed in 0.1 c.c. portions on poured liver agar plates, making a total of 20 plates for each animal. These were placed in tall

* Read before the Laboratory Section of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 30, 1930.

glass specimen jars in which from 5 to 10 per cent of the air was displaced by carbon dioxide. The jars were incubated at 37° C. for 3 days, at the end of which the plates were examined for the characteristic colonies of *Br. abortus*. Suspicious colonies were identified by means of cultural characteristics and agglutination with a positive serum.

After removing the milk used for bacteriological study, rennet was added to the remaining portion of the samples. On the following morning the clear milk serums which had separated were tested for the presence of *Br. abortus* agglutinins by a tube method. Five-hundredths of a c.c. of milk serum was added to 1 c.c. of antigen, giving an approximate dilution of 1–20. This dilution was run on all samples, which were kept at a low temperature so that all positive ones might be repeated in higher dilutions. The antigen used had a turbidity equal to 400 p.p.m. of silica, and was suspended in 0.85 per cent sodium chloride containing 0.5 per cent phenol. The tubes of the agglutination test proper were incubated at 37° C. and the results recorded on the second and third days.

Samples taken from each quarter of 465 animals in 5 herds were examined. The results are given in Table I.

TABLE I

RESULTS OF STUDIES ON FIVE CERTIFIED HERDS

Herd	Number of animals	Milk neg. for *Br. abortus* and agglutinins	Milk showing agglutinins	Milk showing agglutinins and *Br. abortus*
A	36	32	4	3
B	83	74	9	4
C	76	71	5	3
D	220	219	1	0
E	50	50	0	0
Total	465	446	19*	10

* These animals which were found positive by milk agglutination were immediately removed from the herds.

Of the 446 animals from which negative results were obtained in this study of their milk, only 14 have records of positive blood agglutination in dilutions of 1–100 or higher on their last blood test. Of these 14, 10 had been treated with *Br. abortus* vaccine, so the presence of agglutinins in the blood serums of these animals does not necessarily indicate infection.

Of 19 animals in which *Br. abortus* agglutinins were detected in the milk serums, all except 1 gave a record of positive blood agglutination in dilutions of 1–100 or higher upon their last blood test. The history of this animal shows a positive blood reaction in 1–500 dilution in 1923 and 1924, and abortion in 1926. Since that date, agglutinins

for *Br. abortus* have gradually disappeared, and in April, 1930, the blood serum was reported negative. Milk samples taken in May, 1930, gave positive agglutination in two quarters in 1–20 dilution; *Br. abortus* was not detected by plating methods.

Of the 10 animals from the milk of which *Br. abortus* was isolated, each gave a record of positive blood agglutination in dilutions of 1–100 or higher on the last blood test.

Table II shows the relation of the blood agglutination and results obtained in the bacteriological and serological study of their milk.

TABLE II

THE RELATION OF BLOOD AGGLUTINATION AND RESULTS OBTAINED IN THE BACTERIOLOGICAL AND SEROLOGICAL STUDY OF THE MILK

Total animals studied 465				
Blood agglutination negative 433		Blood agglutination positive 32		
Milk agglutinins negative 432	Milk agglutinins positive 1	Milk agglutinins negative 14	Milk agglutinins positive 18	
No organisms in milk 432	No organisms in milk 1	No organisms in milk 14	No organisms in milk 8	*Br. abortus* in milk 10

Positive Blood—agglutinins present in dilution of 1–100
Negative Blood—agglutinins not present in dilution of 1–100
Positive Milk—agglutinins present in dilution of 1–20
Negative Milk—agglutinins not present in dilution of 1–20

The results of the bacteriological and serological studies on the milk of the 10 animals from which *Br. abortus* was isolated are given in Table III.

A review of the results found in the separate herds shows that the milk from each animal in 2 of the herds was free of organisms of the Brucella group as far as could be shown by plating methods. Why were there no organisms found in herds D and E, while plating methods revealed them in the milk from 10 animals in herds A, B, and C? The probable answer is found in the original percentage of infection and the duration of the elimination process by serological tests in the separate herds. The process of elimination in herd D, on the basis of

TABLE III

A STUDY OF 10 ANIMALS FROM WHICH BR. ABORTUS WAS ISOLATED. EACH ANIMAL HAS A POSITIVE BLOOD AGGLUTINATION

Animal		Quarters R.F.	R.R.	L.R.	L.F.
1	Milk agglutination	1–20	1–100	1–100	1–40
	Organisms per c.c.	4	4	None	None
2	Milk agglutination	1–40	1–40	1–40	1–40
	Organisms per c.c.	2	None	18	None
3	Milk agglutination	1–100	1–100	1–40	1–40
	Organisms per c.c.	None	None	2	None
4	Milk agglutination	1–20	1–100	1–20	1–20
	Organisms per c.c.	None	52	None	None
5	Milk agglutination	1–20	Neg.	1–40	Neg.
	Organisms per c.c.	None	None	8	None
6	Milk agglutination	Neg.	1–20	1–40	Neg.
	Organisms per c.c.	None	None	10	None
7	Milk agglutination	1–200	1–100	1–40	Neg.
	Organisms per c.c.	650	58	28	None
8	Milk agglutination	1–40	1–40	1–100	1–100
	Organisms per c.c.	None	2	4	2
9	Milk agglutination	1–40	1–100	1–200	1–40
	Organisms per c.c.	10	10	8	15
10	Milk agglutination	Neg.	1–20	Neg.	Neg.
	Organisms per c.c.	None	8	None	None

Total number of milk samples	40
Number showing agglutinins	32
Number from which *Br. abortus* was isolated	19

blood agglutination, has been in progress for 24 months, whereas in herds A, B, C, and E it has been in progress only for 6 to 9 months. However, of these 4 herds, E had the lowest original percentage of infection; hence the completion of elimination has been more rapidly effected in this one than in the others.

SUMMARY

Samples of milk from each quarter of the udder of 465 animals in 5 certified herds were examined by bacteriological and serological methods in an effort to determine if animals which give negative serological tests excrete *Br. abortus* in their milk. In this series of animals, *Br. abortus* was not detected in the milk from any animal in which agglutinins were not also found in the same sample, nor was *Br. abortus* detected in the milk from any animal unless agglutinins were present in the blood serum in at least a 1–100 dilution.

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A Study of the Epidemiology of Undulant Fever*

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IN 1929 there were 1,305 reported cases of undulant fever in the United States. Some of these were reported through unofficial though reliable sources. Prior to 1925 a total of 128 cases was reported. In 1925, 24 cases were reported and since that year the number occurring annually has at least doubled that of the previous year. In the first half of 1930, 559 cases had been reported to the U. S. Public Health Service as compared with 256 cases for the corresponding half of the year 1929.

In 1929 the disease was present in every state of the Union. It is probable that some of the reported cases were incorrectly diagnosed, but it is almost certain that these would more than be offset by unrecognized and unreported cases. If the occurrence of cases continues throughout the current year at the rate shown in the first 6 months, the incidence rate of the disease in 1930, based upon the population of the whole United States, will be approximately 2 per 100,000, or about one-tenth that of typhoid fever. It may be pointed out that in the past many cases of undulant fever have been called typhoid fever, and as the correct diagnosis of undulant fever increases there will be a proportionate decrease in the typhoid fever rates. However, undulant fever probably will never equal typhoid fever as a public health problem in the United States, as has been reported in some European countries.

Prior to 1929 no seasonal distribution of cases was observed, each month showing an increase over the previous months except for minor variations. In 1929 the number of cases increased gradually from 27 in January to 160 in September, except for a slight drop in August. From October to the end of December they decreased. Thus far in 1930 the rise has been similar, though a greater number of cases have been reported.

From March, 1929, to March, 1930, I was engaged in Field Studies

* Read before the Laboratory Section of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 30, 1930.

of undulant fever in various sections of the United States, and personally collected epidemiological data on 109 cases in 14 different states. Approximately two-thirds of these patients lived in cities or towns having a population of 5,000 or more, and one-third in rural districts. In the State of Iowa, Surgeon A. V. Hardy, working jointly under state and federal authority, carried on similar studies on 375 cases, making a total of 484 on which information was gathered.

The age distribution of our cases resembles that of other reported series, showing a comparatively low incidence in young children, and rapidly increasing in the period of adolescence and early adult life. The distribution between the sexes was nearly 3 males to 1 female.

TABLE I

INCIDENCE BY AGE AND SEX OF 463 CASES

Age Group	Males	Females	Total
Below 5 years	3	2	5
5–9 years	5	3	8
10–14	17	6	23
15–19	28	6	34
20–24	48	7	55
25–29	42	15	57
30–34	35	14	49
35–39	60	11	71
40–44	42	16	58
45–49	26	7	33
50–54	20	11	31
55–59	4	9	13
60–64	7	5	12
65–69	3	5	8
70 and over	2	4	6
	342	121	463

Generally speaking, the occurrence of only 1 case in a household was the rule. In 11 households more than 1 case was found, while in others an indefinite history of an undetermined fever in some previous year was obtained.

In 435 of our cases the information obtained was sufficiently complete to permit a classification into three distinct epidemiological groups: (1) Those having little or no contact with livestock or carcasses; (2) those having contact with livestock and carcasses in the meat packing industry; (3) those having contact with livestock on the farm.

The first group was composed chiefly of those living in urban communities, whose most probable source of infection was raw milk. The second was largely composed of persons living in cities, whose occupation was in some phase of the meat industry, including its by-products.

The third consisted almost entirely of persons living in rural communities, a majority being farmers. These may be conveniently called the milk, meat, and farm groups respectively.

One hundred and ninety-eight cases were placed in the milk group, of which 103 (52 per cent) were males and 95 (48 per cent) females. The meat group contained 44 cases, 43 (98 per cent) males and 1 (2 per cent) female. The farm group had 193 cases, 184 (95 per cent) males and 9 (5 per cent) females.

The Milk Group—This was composed almost wholly of professional and business persons, laborers (other than on farm or in meat packing industry) and students, the latter including school children.

The information received as to consumption of dairy products by persons in this group showed that 178 used raw milk regularly, while in 20 part of the milk used was raw and part pasteurized. Creamery butter, which is practically always made from pasteurized cream, was used by 181 (91 per cent) of the persons in this group. Nine used no butter. Cheese was used by nearly all, but rarely was the use of imported cheese found. Many different brands of American cheese were used, but no particular kind seemed to be associated with an unusual number of cases.

Generally speaking, cases of undulant fever are so scattered that it is unusual to find a group of cases associated with a common milk supply. However, in 9 occurring in Waycross, Ga., in 1929, none had significant contact with livestock, all used raw milk, and 8 used milk from the same dairy. Approximately half of the milk supply of the city was raw, and half pasteurized.

In two of the Waycross cases cultures of Brucella were obtained from the blood and both were of the *suis* variety. Cultures were not made from the animals in the dairy herd, but agglutination tests showed the presence of reacting animals. Since pasteurization of all milk became effective in Waycross, on March 1, 1930, there have been no new cases of undulant fever in the city. The epidemiological evidence suggests no other explanation than an infection with the *suis* variety of Brucella transmitted through milk.

The Meat Group—This consisted of 40 packing house employees, 2 butchers, 1 worker in a rendering plant and 1 employee of a plant manufacturing hog-cholera serum. The 1 female in this group was a packing house employee engaged in making sausage casings. The association of all the cases with pork and pork products is worthy of note. In this group 8 persons used raw milk regularly, 2 part raw and part pasteurized, 23 pasteurized milk regularly, 3 canned milk, and for 8 information was not complete.

The Farm Group—There were 193 cases, chiefly of farmers (including members of their families and farm laborers), veterinarians, and livestock dealers. One hundred and eighty-eight persons in this group used raw milk, 1 part raw and part pasteurized, 1 canned milk, and 3 no milk. In the great majority the milk was obtained from farm animals with which the patient came in contact repeatedly.

EVIDENCE OF INFECTION IN ANIMALS

In the dairy herds supplying milk to the cases of the milk group the presence of Brucella infection was proved by serological or cultural studies in 39. Three other herds contained animals regarded as suspicious as a result of agglutination tests. In 10 other cases the history of the presence of the infection was quite definite, though not proved by laboratory procedure. While this number seems small it should be remembered that most of this group lived in cities and had little information concerning the health of the animals from which their milk supply was derived.

Many patronized milk dealers who obtained their milk from 2 or more herds, from a milk producing area that was presumably infected. We may expect better information as to the presence of the infection in the area furnishing milk to cities, as health departments, physicians and veterinarians apply our newer knowledge of undulant fever.

The herds of cattle with which 53 of the cases of the farm group came in contact were proved positive by laboratory tests, and 11 others had animals whose blood showed a suspicious but not diagnostic reaction. In 33 additional herds the presence of the infection was reported, though not subjected to laboratory tests, and in 4 others the history was suspicious. Of 60 herds of hogs in Iowa with which cases of this group had contact, 24 were found positive on serological test, 17 suspicious, and 19 negative.

EVIDENCE OF INFECTION WITHOUT SYMPTOMS

There is probably no infectious disease that has suffered as much from misnomers as have the conditions due to Brucella infection. In man it has had at least 50 names, of which undulant fever is the least objectionable, but that may mislead in that the fever does not always show the wave-like curve. In veterinary medicine the term infectious (or contagious abortion) is based upon a prominent symptom, yet abortion does not always occur in infected pregnant animals. The more recent term Brucelliasis (or Brucellosis) signifies a state of infection with Brucella and includes all cases without regard to symptoms, geographic location, or other consideration except the etiologic

agent. It has been shown that persons may be infected with this bacterial genus without showing significant clinical symptoms.

In February, 1930, the Laboratory of Animal Pathology of the University of Illinois and the Hygienic Laboratory at Washington jointly tested the blood of 74 Illinois veterinarians, 13 workers of the Illinois laboratory exposed to Brucella infection, and 8 clerical employees of the laboratory, presumably not exposed. Sixteen of the 74 veterinarians showed the presence of Brucella agglutinins, 3 of these in dilutions of 1:80 or higher. Three of the 13 laboratory workers showed the presence of agglutinins, one in 1:160 dilution; 2 of the 8 clerical employees showed partial agglutination in 1:10 dilution.

Huddleson and Johnson[8] applied the agglutination test to 49 practising Michigan veterinarians and 57 per cent showed the presence of agglutinins, 29 per cent reacting in 1:100 dilution or higher.

In Denmark, Axel Thomsen[9] tested, by agglutination and complement fixation tests, 272 persons that had direct contact with cattle and 61 not having such contact. The no-contact group gave negative results; the contact group showed the following positive reactions to one or both tests:

No. in Group	Reacting Positively
65 veterinarians (1 yr. or more practice)	61
16 bacteriologists	10
21 herdsmen	13
25 milkers	6
23 herd owners	9
20 drovers	1
10 milk testers	1
25 butchers	5
12 meat inspectors	4

In view of such results the diagnosis of undulant fever should not rest solely upon an agglutination test but upon clinical symptoms, supplemented by serological, and, if possible, by cultural tests.

The question of the isolation and differentiation of the varieties of Brucella does not belong in a paper on epidemiology, other than to point out that all varieties have been isolated from human cases, and generally speaking the clinical picture produced by all varieties is similar. In a series of cases it appears that the symptoms due to the *abortus* are milder than those produced by the *suis* or *melitensis* strains, but in a single case an opinion as to the causal variety of Brucella can be but little better than a guess.

While it is desirable that as much light as possible be thrown on the differentiation of the varieties, it is a matter of small importance from the standpoint of the patient. The unfortunate individual finds

himself ill with a continued disabling fever no matter what strain is associated with his case.

Since all varieties of Brucella give an agglutination reaction against a common antigen, and when symptoms are produced all cases appear clinically identical, for epidemiologic purposes we should, at least for the present, consider the Brucella genus rather than the species or variety. All 3 varieties of Brucella have been isolated from cattle, the mammalian species of greatest importance from the immediate standpoint of the health official. Apparently the *suis* variety is able to infect nearly all species of domestic animals, and the possibility of the infection coming from unusual animal sources should not be overlooked in the epidemiologic investigations.

Up to the present, transmission from one human being to another by contact appears very infrequently, if at all. The finding of Brucella in the stools of patients by Amoss and Poston[1] warns us that such transmission may be possible.

Madsen[4] reports that in Denmark 7 out of 8 observed pregnant women aborted and in 2 of these *Br. abortus* was found in the placenta. This brings to mind the possibility of transmission from one human being to another in the course of obstetrical attendance of an infected case.

In closing, I wish to call attention to the tendency toward attributing cases to milk-borne infection. This is natural from the long period during which transmission of the caprine infection was thought to be entirely dependent upon the consumption of goats' milk. Madsen[4] reports that in Denmark about 40 per cent of cases are attributed to milk, and 60 per cent to contact with infected animals; while our figures show 45 per cent and 55 per cent respectively. It should be emphasized, however, that in the group attributed to contact many cases have consumed milk from their own infected animals.

The California State Department of Public Health[2] in *Bulletin No. 50* states that raw milk should not be directly blamed unless one or more of the following conditions are fulfilled:

1. Shedding of Brucella in milk as proved by laboratory data
2. The extent of infection in the milk herd determined by agglutination test
3. Positive results from direct inoculation of guinea pigs with centrifugalized specimen of pooled milk
4. A history of recent abortions in the herd
5. A history of recent use of live organism abortus vaccine in the herd

In our work this standard was not applied, especially in the earlier part, but experience obtained during our investigations led us to stress the inquiry into the herd histories whenever it was possible to do so.

If the above mentioned requirements are kept in mind and inquiry is made as to the presence of Brucella infection in dairy herds and other farm animals, our rapidly accumulating epidemiological data will become more reliable and valuable, and our bacteriological support of the same will be greatly improved.

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Italy's Maternity Insurance and Maternity-Welfare Work

THE law on compulsory maternity insurance of factory workers has been functioning in Italy for 17 years. The number of insured women increased from less than half a million in 1912 to more than a million in 1929. A still greater increase is expected to take place as the result of a law which went into effect in October, 1930, and which extends the compulsory maternity insurance to non-manual workers in a large number of occupations and to government employees.

The insured women are paid a benefit of 150 lire at the time of confinement, and those who are subject to unemployment insurance are also paid an unemployment benefit for 1 month before and 1 month after confinement, during which time they are not allowed to work.

Another feature of the maternity welfare work is the establishment of health centers for expectant mothers where they are given physical examinations and simple treatments, and are taught the rules of hygiene. A large number of such health centers have been established in the last few years by the National Children's Bureau of Italy; the National Social Insurance Fund administering the maternity insurance law has also begun to establish such centers.—*Le Assicurazioni Sociali*, Rome, 1930, 6, 5: 77, and various issues of *Maternità ed Infanzia*, official organ of the National Children's Bureau of Italy.

Minimum Qualifications for Those Appointed to Positions in Public Health Nursing*

THE following definitions of desirable minimum qualifications for persons appointed to public health nursing positions are offered in the belief that they can be met quite generally by the year 1935. It is obvious that a higher level of requirements has already been reached in certain official and volunteer health organizations, particularly in the field of experience with communicable disease, and for supervisors in the matter of academic degrees. Minimum qualifications will be advanced with the years as the quality of nursing education and practical training is generally improved. Those offered here must be considered as representing a stage in development and progress.

STAFF POSITIONS

I. *For the Nurse on a Staff Providing Well Qualified Nurse Supervision*

Minimum qualifications for 1935:

A. At least high school graduation or its educational equivalent as determined by the State Department of Education.

B. Fundamental nursing education—namely:

Graduation from an accredited school for nurses connected with a general hospital having a daily average of 50 patients or more. Curriculum should include practical experience in caring for men, women and children, together with theoretical and practical instruction in medical, surgical, obstetrical, and pediatric nursing. Such experience may be secured in one or more hospitals.

It is highly desirable, in addition, that preference be given the public health nurse who has had training in communicable diseases (including tuberculosis and venereal diseases); psychiatric diseases and mental hygiene; and such specialties as diseases of the eye, ear, nose and throat; experience in outpatient clinics; and 2 months' affiliation with some well organized community health agency.

These services may be given in the school, as an affiliation with another school of nursing, or as a postgraduate course.

C. State registration.

For those nurses not meeting the educational and professional requirements of the above outline, occasional exceptions may be made, if profes-

* Prepared by the Committee on Education of National Organization of Public Health Nursing and endorsed by the Public Health Nursing Section, the Committee on Training and Personnel, and the Committee on Research and Standards of the American Public Health Association, March, 1931.

sional training or experience has developed a wisdom and judgment which are valuable in the public health nursing field.

II. *For the Nurse Working Alone—i.e., Without Qualified Nurse Supervision*

Minimum qualifications for 1935:

A, B, and C, as above.

D. In addition it is desirable that she have had:

1. At least 6 weeks' instruction in public health nursing, preferably in one of the recognized public health nursing courses, and 1 year's experience under adequate supervision; or
2. Two years' experience under adequate supervision; or
3. A public health nursing course endorsed by the N. O. P. H. N.

Occasional exceptions may be made for those not meeting this academic and fundamental nursing standard, but such nurses should have proved their ability before being appointed for positions where they work alone, and should be expected to meet requirement D.

It is of primary importance that every public health nurse have suitable qualifications.

SUPERVISOR OR DIRECTOR IN A PUBLIC HEALTH NURSING ORGANIZATION *

I. *Supervisors*

It is expected that those appointed to positions of supervisory rank have the equivalent of the educational and professional background described as a standard for the staff nurse, namely:

A. At least high school graduation or its educational equivalent as determined by State Department of Education.

B. Fundamental nursing education—namely:

Graduation from an accredited school of nurses connected with a general hospital having a daily average of 50 patients or more. Curriculum should include practical experience in caring for men, women, and children, together with theoretical and practical instruction in medical, surgical, obstetrical and pediatric nursing. Such experience may be secured in one or more hospitals.

It is highly desirable, in addition, that preference be given the public health nurse who has had training in communicable diseases; psychiatric diseases and mental hygiene; and such specialties as diseases of the eye, ear, nose and throat; experience in outpatient clinics; and 2 months' affiliation with some well organized community health agency.

These services may be given in the school, as an affiliation with another school of nursing, or as a postgraduate course.

C. State registration.

D. At least 1 year's supervised experience in a well organized public health nursing agency.

E. A public health nursing course endorsed by the N. O. P. H. N.

* For those nurses not meeting the educational and professional requirements of the above outline, occasional exceptions may be made if professional training or experience has developed a wisdom and judgment which is valuable in the public health nursing field.

In making promotions and new appointments to supervisory positions preference should be given to those with certain personal qualifications which, though difficult to measure, are vital to her work, such as special technical skill in the field she supervises, ability to impart information, to win confidence of staff, and to inspire voluntary requests for help; ability to delegate work with a fair balance in responsibilities assigned, and to stimulate initiative on the part of staff; ability to correlate work with that of other agencies in related health and social fields; breadth of vision covering both the aims of her profession and the work of her organization in relation to a unified community health program, with the initiative and imagination for developing new work.

II. *Educational Directors*

The educational director would need all these general qualifications together with advanced academic preparation including educational subjects if possible. It is especially important that, in addition to proven teaching ability, she shall show signs of imagination so that she can fit her individual and group teaching to the immediate needs of her staff and to the broader developments in the community's health program. She, as well as the director, must have the vision to be a few steps ahead of present practice.

III. *Directors*

The highest standard of qualification should be required of an executive director. She should have more than the minimum education required of her staff. It is desirable that she have an advanced academic preparation, preferably a college degree.

The director's experience should include at least 2 years in a public health nursing service, emphasizing family service. In addition she should have had experience as a supervisor, and, when possible, as an assistant executive director. She should have sound administrative ability to organize and direct the work.

Such a background would prove her teaching ability, her knowledge of technical skills, and her ability to cope with larger problems of organization and administration. Her distinctive contribution should be the ability to interpret the needs of her organization and of the community to her committee and board members, and to be a leader in community health developments.

The Mantoux Test

1. The Mantoux test is extremely valuable in children. It is easy to perform and is quite painless.

2. Care being taken to exclude the sources of error, . . . a negative result excludes tuberculous infection and is a comforting finding in debilitated children after measles, whooping cough, and broncho-pneumonia, and in cases of chronic cervical adenitis and so-called " intestinal indigestion."

3. A strongly positive result in young children suggests active tuberculous disease and usually justifies a bad prognosis.

4. A mild positive result indicates tuberculous infection (not necessarily disease), and children showing such a reaction would benefit from open-air treatment and increased prophylactic precautions.—The Mantoux Test, by Wilfrid F. Gaisford, *Lancet*, Mar. 7, 1931.

Observations on Industrial Hygiene*

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IMPRESSIONS gained from visiting industrial medical departments and inquiries received from industrialists and industrial physicians reveal a condition of affairs in the practice of industrial medicine marked by variations and dissimilarities in method and objective which at times amount to positive contradiction.

I am not endeavoring to raise the colorless banner of standardization, but it does seem that the time has come for a body such as ours to consider what should be the professional equipment of the industrial hygienist. This paper endeavors to deal with two questions: (1) Should the industrial hygienist be specially trained? (2) What are the facilities for such training and the use made of them?

A clarification of terms is essential here. We speak of industrial physicians and industrial hygienists, frequently using the terms in the same sense, whereas there is a wider difference between the two than between a general practitioner and a nose and throat specialist. Many industrial concerns consider their needs well met when they make available to their employees the services of a skilled surgeon, usually with the specific purpose in mind of satisfying their responsibilities under the compensation law. Obviously, the main requirement of the physician who undertakes this branch of industrial work is that he be a competent surgeon.

Industrial medicine has progressed far beyond this point and the majority of the larger employers of labor are looking for much more than repair work from their medical officer. We are faced by an ever growing intelligent demand from industry for the application of the principles of preventive medicine in industrial establishments and nowhere is there a greater opportunity for this branch of medical science.

The attitude of the industrialist is based on economics. Given a situation that presents a sound economic basis and an unlimited opportunity for action, there can be but one answer—progress. Here we have an industrial nation filled with mines, railways, and manufactur-

* Read before the Industrial Hygiene Section of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 27, 1930.

ing plants of every conceivable type, commercial and financial establishments, employing 30,000,000 wage earners, most of them protected by compensation laws which are being expanded to include compensable illnesses; we have a persistent and increasing demand for the protection of the health and well-being of workers both from themselves and from those who employ them. Industry is interested not only in the treatment of disease but more so in its prevention. What a marvelous opportunity!

There is still a wholly inadequate conception of what this opportunity means in terms of the public health. Tuberculosis is an industrial problem; the prevention and control of heart disease is an industrial problem; the field of action for mental hygiene lies largely in industry, as does venereal disease control. In industry the association of numbers makes possible accomplishment on a large scale, and, by utilizing the industrial approach, preventive medicine can be carried through to the family.

The statement is frequently made by apparently well informed persons, including medical men, that any graduate of a class A medical school is competent to accept a position as medical director of an industrial establishment and fulfil the duties and responsibilities of such position in a satisfactory manner; yet I know instances of men with good all round medical training who have been serving factories for years and have been entirely unaware of the presence of occupational hazards in those plants until damage suits for occupational illness were filed against the firm employing them. I have had the experience of visiting several large concerns which had physicians in constant attendance, where in each instance there was a major hazard from lead poisoning and where also there were differing standards of diagnosis and treatment, none of which were tenable in the light of our present knowledge.

It is obvious that the physician who aspires to practise as an industrial hygienist needs special training before he can qualify in that capacity. To be sure, many industrial physicians acquire a fair working knowledge of industrial hygiene, while they are carrying on their routine duties in mine, factory, or commercial establishments. It is increasingly evident that industry is expecting from its medical officers definite activities aimed at the prevention of illness, which presuppose a type of training not possessed by the ordinary medical graduate. In other words, they expect these medical officers to be hygienists as well as physicians; but there is no more reason why a physician should essay the specialty of industrial hygiene without special training than the specialty of psychiatry, or nose and throat surgery.

The industrial hygienist should have a fair knowledge of the physiological aspects of ventilation and be able to correlate any given condition with the effective temperature chart. He should know enough about illumination to be able to measure the available light and estimate its quantity in relation to the job to be done, and be able to recognize glare and correct it. He should know under what conditions it is desirable to take air and dust samples, and what methods should be employed in taking air samples and analyzing them. He need not be familiar with the technic of analysis, but he should know when such proceeding should be resorted to, just as the general practitioner knows when a patient's tonsils should be removed though he may not practise that branch of surgery. He should know something about fatigue and posture in relation to efficient work.

The industrial hygienist should know enough about occupational poisons to be aware of those, if any, which are hazards in the plant under his care, and he should know the symptoms, methods of diagnosis and treatment of such poisons, and the means of controlling the hazards.

The industrial hygienist should have a working knowledge of statistical methods. An outstanding need in the public health field today is for morbidity statistics, especially in relation to occupation. There is more than one good industrial medical department with a conscientious and efficient medical director in charge, the value of whose work is largely unrecognized by his firm because of his inability to present the results in the clear-cut statistical manner which carries conviction. Over and above these technical subjects, the industrial hygienist will fall far short of his opportunities unless he appreciates the human problems of industry and can deal with them sympathetically.

He should know something of the problems of employment—whom to pass and whom to reject; what to do with the substandard man. The physical examination is becoming more and more an essential requirement for employment, and properly applied and followed up it is of tremendous benefit to the individual as well as to the industry. There is a danger, however, that industry will begin to believe that it can successfully pursue a policy of accepting and rejecting applicants for work on the same basis that the military forces recruit their strength. Nothing could be more fallacious. There are many thousands of persons who have physical handicaps of varying severity but nevertheless must work to support themselves and their families, and, moreover, are quite capable of working to good advantage if properly placed. It is unthinkable that these persons should be doomed to idle-

ness and charitable support for economic as well as humanitarian reasons. It is to the industrial hygienist that industry must turn in order to deal with this and similar questions, and industry is always ready to listen to informed and intelligent opinion.

If we admit that the physician who undertakes to practise in the preventive field of medical science as applied to industry should receive special training in the necessary branches of learning, then we must be concerned with the facilities for such training and the extent to which they are employed. Excellent courses are available, among others, at the medical schools of the following institutions: Ohio State University, Yale, Harvard, University of Pennsylvania, Columbia, and Johns Hopkins. Similar courses are available at some of the technical schools. The following brief descriptions are summarized from communications kindly furnished by officials of these schools:

Columbia—In the College of Physicians and Surgeons: 8 lectures in industrial hygiene to fourth year medical students, as part of the course in public health administration. To graduate students there is a comprehensive course, including technical instruction, as well as field work.

Yale—Three lectures in industrial hygiene; 2 conference periods, 1 factory excursion as part of the course in the principles of public health. This course embraces all medical and public health students. There is also a course of 30 hours of lectures and field work, which is elective for medical and graduate students.

Ohio State University—Senior medical students are required to take 6 hours of lectures and demonstrations in industrial hygiene. Ventilation and occupational diseases are dealt with. Since 1915 there has been available to upper class men and graduates a course in industrial hygiene, for 3 of the quarters of the year, 3 to 5 hours in each quarter. This is required of certain engineering groups, and is elective for medical, education, commerce, and art schools. There are always 2 or 3 students carrying on major research studies among registered candidates for Master of Science degrees. A number of students in the graduate school also elect minor research studies for theses.

University of Pennsylvania—Undergraduates: 3 to 4 lectures in industrial hygiene and health hazards. There is also an elective course for fourth year medical students covering 12 weeks, including lectures, laboratory, and field work. Graduates: a course in industrial hygiene, comprising 1 lecture a week for one-half year; 1 semester hour a week for one-half year; one-half day a week plant survey. The students taking this course are mostly candidates for Ph.D.; some are physicians.

Johns Hopkins—School of Hygiene and Public Health: A very complete course in physiological hygiene to furnish practical preparation for field work in industrial hygiene.

Harvard—In the Harvard School of Public Health are courses in industrial medicine embracing industrial toxicology, organization of industrial medical departments, factory sanitation and safety engineering; also courses in the physiology of respiration, including effects of dust inhalation, general circulatory physiology, neuromuscular physiology, including fatigue—all supported by laboratory experiments.

University of California—There are two courses in industrial hygiene in the department of hygiene. The students must have some prerequisites in hygiene and biology. One course is devoted to the principles of industrial hygiene, industrial physiology, prevention of occupational diseases, plant sanitation and safety. Another course embraces the organization of industrial health service, including lectures, laboratory and field excursions.

McGill University—This school offers special instruction in industrial hygiene and maintains in coöperation with the Montreal General Hospital an occupational disease clinic.

In these schools there are also courses in vital statistics which, if not included in, can be correlated with, the courses in industrial hygiene. All this is very satisfying and reflects great credit on the foresight and energy of the small band of enthusiasts who have developed these courses at the various schools.

Inquiry as to the number of persons taking these courses produces a feeling of anxiety. One university states there are 6 to 8 persons taking the work in industrial hygiene; another 4 to 8 students; another says the students vary from 2 to 8 or 10, only 1 having chosen an elective course; another had 6 students in 2 years for the industrial hygiene course; while from another comes the information that the attendance is growing steadily, but no definite number is given.

The total number is not imposing, and taking the largest figure in each case does not total 100. Moreover, not all of these are physicians or candidates for the M.D. degree. Probably less than half are physicians and of these only a portion will ever become actively identified with industry.

It is evident that the greater part of medical officers in industrial establishments are acquiring or have acquired their experience while working in the industry. Most of the good work that is being performed in industrial medical departments is built up on the pioneering efforts of courageous physicians who had vision and were not afraid to tackle something new. We are definitely emerging from the pioneering period. Not only is industry demanding more physicians, but the industrialist has learned that the degree of M.D. does not necessarily carry with it a knowledge of factory sanitation, specific occupational hazards, or how to handle men.

The medical schools are endeavoring to do their part. It remains for the physician himself, individually and collectively, to recognize the need for special training and to insist upon it as a requisite in the practice of this specialty as well as any other. Also I believe that there devolves upon this body the responsibility of defining minimal requirements for the practice of industrial medicine for the benefit of both the industrialist and the physician. The industrial hygienist

should emerge from the obscurity in which he has too frequently buried himself, and play a larger part in his community, both in his contacts with the community at large and in medical and professional associations. The presentation of his problems and achievements at medical gatherings would be of value not only to himself but to his fellow practitioners who in various capacities are continually increasing their contact with industry.

A year ago my predecessor, Dr. Rector, read an admirable paper entitled "What O'clock is it in Industrial Hygiene?"[1] In answer to his question, it is time to set off the alarm and arouse ourselves from a condition of satisfied somnolence.

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Effect of Factory Work on Motherhood in Germany

A STUDY of the effect of factory work on motherhood was recently made in Germany under the auspices of the Ministry of Labor and under the direction of Dr. Ludwig Teleky, chief medical inspector of factories of Prussia, and author of numerous works on industrial hygiene.

The study covers nearly 3,000 women and 7,700 children. For purposes of comparison the women were divided into two groups: factory workers, and housewives. In making the study the officials of the Ministry of Labor were aided by physicians and welfare workers connected with the health centers attended by these women.

It was found that the women who worked during the last few weeks of pregnancy gave birth to children of lighter weight than those who stayed at home during the entire period of pregnancy. Since this was not due to a difference in the social or economic conditions the authors of the report attribute this to the effect of factory work during the latter part of pregnancy. The percentage of stillbirths was greater among the factory workers. The infant mortality rate was higher among the children of factory workers than among the children of housewives, namely 126 per 1,000 live births against 106 per 1,000 such births. The difference in the mortality rate of the above two groups is particularly high beginning with the 7th week of the child's life, that is, the time when the mother usually returns to the factory and stops nursing her child.

The investigation took place in the Rhineland where the economic conditions are more favorable and where maternity and infant welfare work is better organized than in other parts of Germany. It is obvious, in the authors' opinion, that the data concerning the working women in other cities would show more serious effects of factory work.

The authors conclude their report with a plea for an extension of the work of the health centers and a better financial provision for the working mother so as to enable her to remain at home during the last few weeks of pregnancy and a considerable part of the child's infancy.—Die Wirkungen der Fabrikarbeit der Frau auf die Mutterschaft. *Arbeit und Gesundheit*, publication supplementary to *Reichsarbeitsblatt*, Heft 14, Berlin, 1930.

West Virginia's Public Health Program*

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DURING the past few years, West Virginia has experienced a rapid growth and development of public health service. We have made substantial progress in the solution of our peculiar public health problems and have developed a system of administrative practice in some instances well adapted to our governmental organizations and our political economy. In the beginning, with special studies of certain prevalent diseases, the problem of control was very slow and unsatisfactory until the state realized that a system of public health administration must be provided that would deal with our whole public health problem rather than with any one part. As a result, the state department of health has been materially strengthened. We have gone far in the strengthening of local health service and development of local health departments under trained leadership. The fact that we have made some progress should encourage us to make further progress. Much remains to be done. Local health service needs to be intensified and improved in its efficiency. The problems of counties and areas to which the present local health organization is not readily applicable must be solved.

Health education in some form has reached most of the population of the state through the many and various organizations, welfare and otherwise, using the word health as the key word for their advancement. People are awakening to the fact that there is a way by which the state and county authorities are able to institute measures that will lessen the dangers of child bearing and protect the children against preventable diseases. This plan of procedure has been so thoroughly demonstrated where it has been tried that its wonderful results have become apparent to all. A plan to organize health service, under the direction of trained leadership, that will serve the counties and areas not receiving such services would probably interest the legislature and county courts in making the necessary appropriations for administering the service.

In the undertaking of this task of making the public health ad-

* Presidential Address, delivered before the Annual Meeting of the West Virginia Public Health Association at Morgantown, W. Va., November 21, 1930.

ministration more efficient and effective there is no single element more important than that part which the physician may play. It has been thoroughly demonstrated to the satisfaction of the health organization that the attitude of the public and medical profession must be in accord in order that it may succeed. Any method of public health administration must recognize the principle that the public health and medical organizations jointly serve the public interest.

It is now recognized that preventive medicine and the administration of public health programs constitute a specialty of medicine. The health officer is a specialist in preventive medicine. It is his obligation and duty to instruct people how to keep well, to obtain an immunity status so far as possible, and interpose the necessary barriers to the spread of infections. He should restrict his activities to his specialty so as not to infringe on the physician's rights, or violate what is known as professional courtesy. The health officer is not in competition with the physician. His services are intended to strengthen the faith and confidence of the people. The health program will do more to increase the physicians' income than to curtail it, provided they accept it, and use it for that purpose. The object is to preserve the interest of the public and profession.

People have become so enlightened by reading magazines and syndicated news articles that it is essential that they be properly directed; otherwise there is great danger of their falling into the hands of charlatans and quacks, or that they may resort to patent medicines. Experience in public health administration indicates the soundness of the statement, "the practising physician is the most essential arm of preventive medicine," because every health officer knows that he is dependent on the physicians for discovery of cases, early diagnosis, and prompt reporting. One of the saddest mistakes a physician can make is to neglect this important duty he owes to society. In some instances he will not only neglect to report but will undertake to look after the danger of spread of an infection himself, which may get beyond his control, injure his reputation, and endanger the public. Then it is we have an unwarranted criticism brought against the health authorities that cannot be explained without exposing the physician.

In the administration of any public health program it is perfectly possible for the health officer to utilize the services of physicians to the credit of the medical profession. This is done in all places where the public health program is meeting with success, and is as it should be. The only chance for conflict or misunderstanding between a public health official and practising physicians is where the health officer is not sufficiently trained to stay within bounds of his specialty, or the

physicians do not try to acquaint themselves with the duties of a health officer, the neglect of which would make it very easy to misunderstand.

Public health service does not, and is not intended to, curtail a physician's income. It has a tendency to strengthen confidence and educate people to consult a physician when otherwise they would not do so. The large number of cases referred to the physician by members of the health service will increase his income, provided he takes advantage of the opportunity. Physicians should refer to the health officer all cases of drainage, garbage and sewage disposal, and water supply, or any condition that he may suppose to be dangerous to health. He should consult with the health officer regarding the occurrence of contagious diseases in his practice. In this way, a satisfactory conclusion may be reached and measures adopted by the health official that will prevent an epidemic, thereby preserving the interest of physicians and health officer, together with protection to the public.

It is about time for the industrial corporations to understand that they are liable for certain preventable diseases occurring among their employees as they are responsible for accidents resulting from imperfect, improperly adjusted, or unprotected machinery. It is believed to be right and just for the compensation commission to have the authority to require any employer to provide sanitary living conditions for his employees, to require them and their families to be immunized against typhoid fever, diphtheria and smallpox, with a distinct understanding that when anyone is permitted to work without being so protected—which may result in a case of typhoid fever, diphtheria, or smallpox—the employer shall be considered responsible and be required to compensate the employee to the full extent of injury incurred by him or any of his family having a case of typhoid fever, diphtheria, or smallpox. While this protection is advised for anyone employing labor it can be enforced only where there is an organized health unit with a trained health officer having jurisdiction to instruct and see that the preventive measures are properly carried out.

Public health service is a business enterprise dependent upon the public for its successful maintenance. The public will not be interested in any project until it knows something about its purposes and accomplishments. Members of county courts are selected business men, elected to that position by the people. They cannot be expected to continue to make levies sufficient to support health work unless they are satisfied that their constituents, the people whom they serve, are satisfied that the health unit is for their good and the money spent for that purpose is producing good results.

People will not respond until they are approached in a proper way and understand something of its merits. As a business, health must be advertised. In addition to personal contact and other methods, newspaper publicity must be used. Short newsy informative articles thoughtfully prepared by the health officer, or an occasional interview will be accepted by newspapers. In this way, the public can be regularly informed of the activities of the service, and it gives the health officer an opportunity to perform a duty he owes the people by giving them public notice of any impending danger arising from some general insanitary condition which he desires the public to assist him in correcting. He can at least let the people know of the existence of contagious diseases and what they should do to prevent them.

This association recognizes all unofficial agencies doing any kind of health work within the state. We congratulate them on the splendid results they have achieved.

The executive committee decided, on account of the approval by the health association of the organization of the West Virginia Child Health Council, recommended by the White House Conference Committee, to discontinue for the present the organization of county health associations and allow the State Child Health Council to organize component county child health councils, which include the representatives of all existing unofficial agencies. How far they have succeeded in organizing the state we are unable to report, and beg leave to have the Child Health Council make its own report.

I desire again to remind the members of the West Virginia Public Health Association that while wonderful progress has been made, there is much to be done. Let what has been accomplished act as a stimulus for us to redouble our efforts for greater achievements. We will let nothing swerve us from our duty. Remember, when things look blue and we are inclined to become discouraged on account of insufficient funds with which to work, that there is an old motto we might apply, "He that does no more than he is paid to do, will not be paid any more than for that which he does."

I wish to thank you for the confidence reposed in me by advancing me to this high office. I gladly surrender the gavel to my successor and wish for his great success, for I feel that you will accord to him the same generous and loyal support that you have to me.

EDITORIAL SECTION

Expressions of opinion and statements of supposed facts are published on authority of the writer under whose name they appear, and are not to be regarded as expressing the views of the American Public Health Association, unless such statements or opinions have been adopted by vote of the Association.

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THE MEDICAL SECTION OF THE WHITE HOUSE CONFERENCE

THE Section on Medical Service, of the White House Conference on Child Health and Protection, held its final meeting in Washington, D. C., February 19–21, 1931. This was a fitting climax to a noteworthy undertaking. It brought together outstanding investigators in the field of child hygiene and made possible an exchange of professional ideas scarcely likely to occur under less auspicious circumstances. In earnestness of purpose and character of personnel it was reminiscent of similar meetings in the heyday of the American Association for the Study and Prevention of Infant Mortality. It was interesting to note how many of the pioneers in this movement were present.

Very impressive was the breadth of view, and at the same time the detailed study, evinced by various speakers in different group meetings of the Conference. The reports presented there reflected careful and exhaustive investigation and were phrased with true scientific caution. The committee reports had been thoroughly discussed in preliminary meetings, and common agreement reached upon all points presented, before the final meeting took place. Ample opportunity was afforded for discussion of controversial points in these sub-committee meetings, but fortunately all such matters were omitted from the final reports.

The popular night session, in which results of a nation-wide survey regarding utilization of medical facilities for the preschool child were

discussed, aroused a great deal of interest and commanded rapt attention. The information was presented concretely and illustrated with charts that were clearly understood. While the limitations of such a survey were pointed out, the facts presented were so convincing that they could not have failed to arouse in every representative a determination to return to his district and verify them, while at the same time devising means of looking after the preschool children more thoroughly.

The Sub-committee on Growth and Development had assembled an enormous amount of material which was thoroughly digested and admirably presented. Its discussions centered upon criterions of growth and development, nutrition, and the various factors involved in promoting growth.

The Sub-committee on Maternal and Infant Mortality sounded a challenge to all interested in child welfare. It clearly defined the limitations of present care during maternity and depicted the distance still to be traveled if proper care for mother and new-born baby is to be furnished. The need for better training of our medical students in obstetrics and the importance of prenatal and nursing care were vigorously stressed.

So much detailed technical material was presented to the Conference that it needs to be studied carefully, item by item, in devising ways and means to make proper application to local conditions. A supplement embodying the entire transactions of the final meeting was published April 6 by the *United States Daily*. This should prove a valuable reference in orientating us toward much better care of both mother and child. It is encouraging also to learn that a follow-up committee is in process of formation for the purpose of studying the reports and coming to a better understanding regarding the formulation of plans for more effective procedures. Those having the prime responsibility for the Medical Service Section are to be congratulated upon the success of its labors.

THE TYPHUS–ROCKY MOUNTAIN SPOTTED FEVER GROUP OF INFECTIONS IN THE EASTERN AND SOUTHEASTERN STATES

RECENT observations made by Dyer, Badger, and Rumreich, working at the National Institute of Health of the U. S. Public Health Service, are of great interest from a purely scientific point of view and will have a bearing on the control of certain infectious diseases from an administrative point of view.

It has been found that fleas taken from rats living in an environment which has furnished cases of typhus fever have given rise to a virus infection in laboratory animals closely simulating, or identical with, typhus fever. It has long been recognized that the typhus occurring in the eastern and southeastern states could not be attributed definitely to person-to-person infection by means of body lice, the recognized vectors of this disease in Europe, and of the same disease existing under the name of "tabardillo" in the central plateau of the Mexican Republic.

The observations referred to strongly indicate, as has been suggested by others, that rats and their parasites may play an important part in the maintenance of the focuses of typhus fever in our eastern and southeastern urban communities.

A second observation of great importance was the demonstration that certain of the cases that superficially resembled typhus were in reality due to an entirely different virus infection, one that could not be distinguished with any certainty from the infection of Rocky Mountain spotted fever of the western states, although there were minor points of difference between the two. Present evidence suggests that this infection, hitherto unrecognized in the eastern states, is transmitted by the common eastern dog tick *Dermacentor variabilis*.

Cross immunity tests clearly showed the lack of identity between this newly described virus infection and the typhus with which it had been confused for some time, but such tests did show strong affiliations with the Rocky Mountain spotted fever of the western states. With our present methods, cross immunity tests are to be looked upon as giving us practically conclusive information on such a subject.

Very briefly, the clinical distinctions between the endemic typhus, or Brill's disease, and the more recently recognized infection of the Rocky Mountain spotted fever group are: (1) In the Rocky Mountain spotted fever type of infection the duration of the temperature is irregular, sometimes as short as 7 or 8 days, and in others as long as 3 or 4 weeks, while ordinarily cases of typhus terminate by crisis rather regularly about the 14th or 15th day. (2) The eruption in the Rocky Mountain spotted fever type of infection is likely to begin on the extremities and is prone to be petechial in nature, while in the typhus cases the eruption usually appears first on the thorax and is less likely to be definitely hemorrhagic. The face is much more frequently involved in the spotted fever type than in the typhus group.

Finally, in the way of clinical distinction is the fact that while the typhus cases have long been recognized as giving almost no fatalities, the death rate in the Rocky Mountain spotted fever type, as seen in

the eastern states, is approximately 20 per cent. In general, the cases of the spotted fever type are distinctly more severe than those in the endemic typhus group.

Drs. Dyer, Rumreich, and Badger are to be congratulated on the attainment of such specifically clear-cut results, and it has been again demonstrated that the U. S. Public Health Service, through its National Institute of Health, has been alert in recognizing the importance of the problem of eruptive diseases of the virus group, and has been rewarded by the successful outcome of the experiments and observations undertaken.

REFERENCES

1. *Pub. Health Rep.*, 46: 334–338 (Feb. 13), 1931.
2. *Ibid.*, 463–469 (Feb. 27), 1931.
3. *Ibid.*, 470–480 (Feb. 27), 1931.

HYDROGEN CYANIDE FUMIGATION

THE increased use of hydrogen cyanide, which is our best method of destroying rats and vermin, for the disinfection of ships arriving from foreign ports as well as its use on land, has brought up some interesting questions which have been studied in England.[1]

The conclusions are that the absence of a pronounced taste or smell cannot be taken to show that the food is fit for use. Moist foods absorb more than those which are dry.

The fatal dose of hydrogen cyanide is set at 60 mg., and the permissible quantity has been fixed at from 40 to 50 mg. per 100 gm. It is reported that materials like dates, figs, bacon and sausages which contain from 278 to 890 p.p.m. were after ventilation lasting for a week consumed without ill effects, analyses showing as a rule less than 20 p.p.m. It appears that in foods which contain levulose, a cyanhydrin which is stable in the air and probably not toxic is formed. With dextrose, this is produced only in the presence of an alkali. When potassium cyanide is employed both form cyanhydrin. Certain foods do not deteriorate on exposure to this material, while tea, coffee, and tobacco are said to lose their flavor. Some fruits are injured, while others are not, oranges especially being unhurt, while vegetables unprotected by a thick skin, like cabbage, celery and lettuce, may show wilting.

The use of hydrogen cyanide on living plants is recommended for the destruction of insects, and as the material diffuses slowly into the plant tissue, it can be used in high concentration for effective times. Bacteria and molds are more resistant than the higher plants and HCN has little or no practical value as a disinfectant.

The report concludes that with ordinary precaution, no serious risk is involved in the use of gaseous hydrogen cyanide for the purposes mentioned. The work must be controlled by experienced operators and high concentrations avoided when possible.

REFERENCE

1. Monier-Williams, G. W. *Reports on Public Health and Medical Subjects. No. 60.* The Effect on Foods of Fumigation with Hydrogen Cyanide. H. M. Stationery Office, 1930.

SIGHT SAVING

THE Sight-Saving Review, Volume 1, No. 1, comes to our desk. Its object must appeal to everyone, whatever his particular line of endeavor may be.

The new Journal is designed specifically "to meet the needs of state and local prevention of blindness workers, educators, illuminating engineers, school physicians and nurses, safety engineers, public health administrators, industrial physicians and nurses, sight-saving class teachers and supervisors, ophthalmologists, and any one interested in the sociologic aspects of saving sight." The Editor, Lewis H. Carris, is assisted by a Board on which are a number of well known persons. The printing and make-up are excellent.

We welcome the new Journal, and wish for it the wide success it deserves.

TOO MUCH HEALTH PROPAGANDA?

ALL wise teachers of preventive medicine have recognized that there should be a happy balance between the inculcation of fear of disease and the love of health. For the average person, except those in the prime of youth, the fear of death seems to be the greatest incentive to the cultivation of health. Many teachers pursue the method of evangelists, who picture the terrors of hell and damnation until their hearers are "converted," and then dwell upon the blessings of love.

This general topic has given rise to considerable discussion through some radical statements recently published.[1] We suffer in this country particularly from fads, the prevailing ones relating chiefly to diet, because of the many statements of "food experts" whose attention is for the moment riveted chiefly on vitamins. No less authority than Hinhede has said that "America is vitamin crazy." Most of these faddists lack education; many need employment; and, without doubt,

some belong to a class not entirely normal mentally—though it must be remembered that "The mind forges strange fetters for itself," and even so great a man as Bishop Berkeley held that this material world was nothing, and tar water was everything.

The marvelous things which bacteriology has revealed are responsible for the fact, noted particularly in women, that germs have largely taken the place of the evil spirits of old, as Aldous Huxley has pointed out.

The great prominence given to intercollegiate athletics, under the pseudonym, physical education, is also responsible for some of the present evils. We hear such expressions as "utterly fit," "positive health"; and all sorts of preposterous food habits, exercises, and stunts are indulged in to attain this object. The number of sudden deaths of elderly men on golf links, for example, has been well parodied in the epitaph, "I was well, I wanted to be better, and here I lie."

The article referred to states that there is an American book prescribing physical exercises for infants of 5 months, and there are parents who put their babies through absurd training. Some cases turn out well, but the relation of cause and effect has not been demonstrated. In this country, for several years past, we have devoted much attention and an enormous amount of printer's ink to periodic health examinations, and widespread campaigns have been put on by associations devoted to one form or another of health propaganda, urging early diagnosis for tuberculosis, cancer, etc., with excellent results.

The plain facts seem to be that in infancy and childhood we have accomplished a tremendous saving of illness as well as life. In the middle ages, we have postponed death, while for later years we have accomplished but little. Once before in these columns we have combated the idea, formerly taught by many physicians and even some health officers, that it was better to have the contagious diseases while young, on the ground that they were like debutantes—one must take them young or they go hard. We can but maintain the same general attitude. Such examples as the practical elimination of typhoid fever during the World War, the cleaning up of Havana, the Panama Canal Zone, and other focuses of yellow fever, must for all time prove the wisdom of proper precautions for the preservation of health, and it would be criminal not to teach them, even at the expense of evolving some hypochondriacs.

There will always be health faddists, at least until everybody is entirely normal mentally, but this will not come during the time of anyone now living. We cannot but deprecate the plan of dwelling too much upon disease and creating morbid fears which are anything but

beneficial to the general health. Fear is not a good steady diet, in either religion or health. It may "convert" some, but it does not keep them good. It acts in health matters just as it does in religion—people are good only so long as they are frightened. We are very much like the small boy who prayed at night, but said he could take care of himself in the daytime.

In spite of the damage which we believe has been done by faddists, and those who use fear of ill health for money making purposes, we believe that they have done some good in making the general public ask questions and seek knowledge concerning the body, its normal functions, and diseased conditions. It seems certain, as pointed out by one writer, that in tuberculosis, and probably other diseases, fear has lost its hold. Except in cases of phthisiophobia, fear has not been active in this matter for a long time. Consumption, like the poor, is always with us, and even the extensive campaign which has been going on for the last 25 years against this disease has not awakened an untoward sense of fear in the general public.*

Our feeling is that health teaching and measures for the protection of health must go on. Our great effort should be directed toward the elimination of half educated faddists and uneducated educators. The teaching should be done by people sound mentally as well as physically, who have had proper training, who will avoid exaggeration, and both teach and practise the precept of Saint Paul, "He that striveth for the mastery is temperate in all things."

* It is interesting to note that many religious publications have called attention to the falling off of evangelism and revivals. Only a few stars can now make more than a bare living at this calling.

REFERENCE

1. Hutchinson, Robert. The Pursuit of Health, *Canad. Medical Association Journal*, Jan., 1931, p. 16.

AMERICAN PUBLIC HEALTH ASSOCIATION YEAR BOOK

FOR the first time in the sixty years of the Association's existence a *Year Book* has been issued and is now ready for distribution. Its aim is to provide in a single convenient place all of the committee reports presented at the Fifty-ninth Annual Meeting in Fort Worth, Tex., October 27–30, 1930, and the information concerning the organization, activities and membership of the Association which its members and others may require.

It has been issued in response to insistent demands, reiterated yearly, to publish important committee reports as soon as practicable after their presentation at Annual Meetings. Since 1911, these valu-

able contributions to public health practice and development have appeared in the *American Journal of Public Health* at some time during the year following their delivery. This practice has necessitated delay in making the material available; and even after publication, health workers have frequently been at a loss to know in which volume of the *Journal* a particular report appeared.

It has often been difficult for members to obtain needed information about the Association without consulting many books, bulletins, reports and transactions, or communicating with the central office. Furthermore, no complete list of members and Fellows has been printed since 1927, and the requests for such a roster have been numerous.

The *Year Book* brings all of this material together. The committee reports are published in full, together with the essential facts concerning the work of the Association. The corrected membership list is complete and accurate as of November 1, 1930.

This volume, therefore, should be a useful reference for every public health worker who needs to have at hand brief, concise and accurate information upon the widely varying aspects of his work. The committee personnel is appended to each report and committee members will welcome correspondence when further information is required. The book should be of importance to those members and Fellows who want more than a casual knowledge of the Association to which they belong, and to those who are frequently called upon to serve the organization, on committees or otherwise, it should be indispensable.

ASSOCIATION NEWS

Montreal Committees on Arrangements

THE Chairman of the Local Committee on Arrangements, Dr. S. Boucher, Health Officer of Montreal, announces the appointment of the following sub-committees and their respective Chairmen:

Entertainment—Dr. A. Grant Fleming
Inspection Trips—Theodore J. Lafreniere
Information, Registration, etc.—Mac H. McCrady
Finance—J. Versailles
Publicity—Dr. A. B. Chandler and Dr. J. A. Boudoin
Membership—Dr. Starkey
Ladies' Entertainment—Mrs. Creelman and Mrs. Beaubien

Plans for the registration, housing, and entertainment of the 1,500 delegates expected at the Sixtieth Annual Meeting in Montreal, September 14–17, are in the hands of these committees.

Aime Cousineau, City Sanitary Engineer, is acting as Secretary of the Local Committee on Arrangements.

Western Branch A. P. H. A.

AT the forthcoming Western Branch A. P. H. A. meeting in Seattle, May 28–30, Dr. John A. Ferrell and Dr. Kendall Emerson will represent the Executive Board of the A. P. H. A. Professor Ira V. Hiscock will also be in attendance, representing the Committee on Administrative Practice.

Dr. William C. Hassler, President-elect of the A. P. H. A., is President of the Western Branch.

NEW MEMBERS

Health Officers Section

Homer M. Austin, M.D., Columbus, O., Chief, Division of Hygiene, State Dept. of Health
Edmour Frenette, M.D., New Carlisle, P. Que., Health Officer
William B. Harrison, M.D., Memphis, Tenn., Associate Director, Local Organization, State Health Dept.
T. Douglas Kendrick, M.B., Gravelbourg, Sask., District Health Officer
Ernest A. LeBien, McHenry, N. D., Supt., Board of Health, Foster County
George J. Marbach, University City, Mo., Acting Supervisor of Sanitation
John W. McIntosh, M.B., Vancouver, B. C., Medical Officer of Health
Lloyd Moffitt, M.D., Yakima, Wash., City and County Health Officer
Dr. Eugene Mondor, Mt. Laurier, P. Que., Health Officer
E. K. Musson, M.D., Eldon, Mo., County Health Officer
M. B. Owens, M.D., Newport, Ark., Medical Director, Jackson County Health Unit
Lorenzo L. Parks, M.D., Hamilton, Ala., County Health Officer
L. A. Pequegnat, M.B., Toronto, Ont., Deputy Medical Officer of Health
Thomas E. Tucker, M.D., Monroeville, Ala., County Health Officer
Charles Williams, M.D., Montreal, P. Que., with Dept. of Public Health, McGill University

Laboratory Section

Lois Frayser, A.B., Richmond, Va., Assistant Chemist, Filtration Plant
Nell P. Hall, Springfield, Ill., Junior Bacteriologist, State Dept. of Public Health Lab.
Camille Lherisson, M.D. (Temporarily in Boston, Mass.), Prof. of Biology, School of Med., Haiti
James M. Sherman, Ph.D., Ithaca, N. Y., Professor of Bacteriology, Cornell University
William H. Swartzendruber, B.A., Iowa City, Ia., Bacteriologist, State Hyg. Labs.

Vital Statistics Section

Marjorie E. Gooch, M.S., Baltimore, Md., Statistician, Rural Survey, A. P. H. A.
Louis Weiner, E.E., New York, N. Y., Vital Statistician, Dept. of Health

Public Health Engineering Section

Victor Greiff, E.E., New York, N. Y., Disposal Division, Sanitation Dept.
Charles H. B. Hotchkiss, M.E., New York, N. Y., Editor, Heating & Ventilating
Augusta E. Jay, New York, N. Y., Assistant Editor, American Journal of Public Health
Aubrey H. Perry, B.A.Sc., St. Catharines, Ont., Asst. Engr., Dept. of Natl. Health

Industrial Hygiene Section

Alexander R. Pennoyer, M.D., Montreal, P. Que., Medical Adviser, Bell Telephone Co.

Food, Drugs & Nutrition Section

Clayton P. Osgood, B.S., Augusta, Me., Milk & Dairy Inspector
Max Paun, Detroit, Mich., Physical Education
Rolland E. Spaun, Lansing, Mich., Bacteriologist, State Dept. of Agr.

Public Health Education Section

Estella S. Edson, R.N., Sacramento, Calif., Executive Secretary, Sacramento Tuberculosis Assn.
Wilbur A. Heinz, A.B., Lexington, Ky., Instructor in Hygiene and Public Health, University of Kentucky
Jean V. Latimer, B.S., M.A., Boston, Mass., Educational Secretary, Mass. Tuberculosis League
Robert W. Osborn, Buffalo, N. Y., Executive Secretary, Buffalo Tuberculosis Assn.
Ivan K. M. Scheepers, Johannesburg, S. Africa, Secretary, S. African Red Cross Society (Assoc.)
Savel Zimand, New York, N. Y., Administrative Director, Bellevue-Yorkville Health Demonstration

Public Health Nursing Section

Belle L. Barnstead, R.N., Hillsdale, Mich., County Nurse
Naomi B. Blouin, R.N., Livingston, Tenn., Tri-County Public Health Nurse
Jean M. Campbell, Austin, Tex., Fie'd Nurse
Ada B. Coffey, R.N., Albany, N. Y., Extension Secretary, Public Health Nursing, State Dept. of Health
Helen J. Lapham, R.N., Millerton, Okla., U. S. Indian Service Field Nurse
Ernestine Schwab, San Francisco, Calif., Public Health Nurse, Dept. of Health
Matilda A. Wade, R.N., Wellsburg, W. Va., Public Health Nurse

Epidemiology Section

Robert E. Hickey, M.D., Milwaukee, Wis., Director, Bureau of Communicable Disease
Daniel F. Milam, M.D., Nashville, Tenn., Epidemiologist, State Dept. of Public Health

Unaffiliated

George Boehr, M.D., New York, N. Y., Member, Executive Comm., Committee on Public Health Relations, N. Y. Academy of Medicine
A. H. Burkholder, Quarryville, Pa. (Assoc.)
Joseph M. Callner, Chicago, Ill., Chairman, Public Linen Supply Assn. of America (Assoc.)

DECEASED MEMBERS

Charles J. Hastings, M.D., Toronto, Ont., Elected Member 1911, Fellow 1922, Honorary Fellow 1926
L. C. Bulkley, St. Paul, Minn., Elected Member 1919, Fellow 1923
Henry B. Hemenway, M.D., Springfield, Ill., Elected Member 1918, Fellow 1922
Charles Krumwiede, Jr., M.D., Bronxville, N. Y., Elected Member 1918, Fellow 1922
Lyman M. Ellis, M.D., Kensington, Ill., Elected Member 1919
J. L. Ludlow, Winston-Salem, N. C., Elected Member 1903
W. T. McArthur, M.D., Los Angeles, Cal., Elected Member 1920
M. G. Schlotbom, M.D., Pittsburgh, Pa., Elected Member 1919
G. C. Stevenson, M.D., Youngstown, O., Elected Member 1907
Nathan Straus, New York, N. Y., Elected Member 1903
Paul Preble, M.D., Ancon, C. Z., Elected Member 1923
Arthur O. Bauss, New York, N. Y., Elected Member 1921

PUBLIC HEALTH ADMINISTRATION

HENRY F. VAUGHAN, D. P. H.

Health Program for New York State—On February 16, the Special Health Commission, appointed on May 1, 1930, by the Honorable Franklin D. Roosevelt, Governor of New York, submitted its preliminary report in which it declares that the pressing immediate needs for the commonwealth are: (1) effective local health departments with qualified personnel; (2) more effective service in the control of tuberculosis, cancer and the venereal diseases; (3) more comprehensive measures to reduce infant deaths and deaths among mothers from causes incident to childbirth; (4) further coördination of school hygiene with other health service; (5) better organization for the discovery and cure, rehabilitation and care of crippled children; (6) the extension of public health nursing throughout the state to reach the standards now in effect in a few areas; (7) protection of the public health through additional safeguards in the purification of water supplies and the prevention of stream pollution; (8) more attention to the growing problem of industrial hygiene.

The Commission includes first among its major recommendations that there be created county boards of health to provide for the rural areas and villages, and that in areas with a population of more than 50,000 the health officer must devote his entire time to the duties of his office. It is recommended that there be established three additional state tuberculosis sanatoriums, primarily to receive patients from counties which are too small in population and wealth to maintain suitable sanatoriums. The cost of maintaining patients in such institutions should be met by the counties. It is also suggested that the State Sanatorium at Ray Brook be placed under the direction of the Department of Health. Further, a division of cancer control for the State Health Department is recommended. Other major recommendations provide for a more adequate diagnosis and treatment of venereal diseases, together with protection for the health of mothers and children, public health nursing service in rural areas, coördination of facilities for the care of crippled children, extension of industrial hygiene service, approval of plans for public water supply, and elimination of stream pollution by industrial wastes. It is recommended that the present authority of the Public Health Council to establish qualifications for certain public health personnel be extended to include other positions in the public health field.—Preliminary report of the Governor's Special Health Commission, New York State Dept. of Health, Feb. 19, 1931.

Smallpox in Williamstown—Dr. George H. Bigelow, Commissioner of Public Health for Massachusetts, reports that in a recent outbreak of smallpox which occurred in Williamstown, there resulted 9 secondary cases among 9 unvaccinated exposures. At the same time there were exposed 38 vaccinated individuals, none of whom contracted smallpox.

The first case occurred in the person of V. His wife who had been vaccinated escaped, but the baby, unvaccinated, succumbed. Mrs. V. and the baby had just recovered from chickenpox. V. visited a home in Williams-

town where he had close personal contact with 6 individuals, 5 of whom had never been vaccinated. The sixth individual, who was vaccinated, did not develop smallpox while all of the five unvaccinated became ill.

V. attended a dance in Williamstown at which 35 individuals were present. All save 1 were vaccinated. This 1 developed smallpox while the other 34 escaped the disease.

V. also visited a home in Bennington, Vt., where he had intimate contact with 4 individuals, 2 of whom were unvaccinated and developed smallpox. The 2 who had been vaccinated did not become ill.—*Special Report,* Massachusetts State Health Dept., Mar., 1931.

Typhoid Carriers in Denmark—The State Serum Institute at Copenhagen serves as the central epidemiological laboratory for the entire country and, with the coöperation of the local health boards, receives reports on all new cases of typhoid fever and pays particular heed to the carrier state. A registration system has been established for cases and carriers. There is no absolute guarantee that an individual who has recovered from typhoid fever may not be discharging typhoid fever bacilli, even though previous examinations have shown their absence. Furthermore, the demonstration of a common source of infection will often be facilitated by the knowledge of all typhoid fever cases in the district.

All chronic carriers, that is, those in which the bacilli are demonstrated more than 1 year after the onset of the disease, are placed under strict surveillance of the health board. All patients who are still discharging typhoid fever bacilli 3 months after the onset of the disease are carried as "observation carriers." All information concerning cases and carriers is entered in a tickler file and classified as a new case, observation carrier, or chronic carrier. The State Epidemic Service finds this an extremely valuable method of curtailing the spread of typhoid fever through temporary or chronic carriers. A card index system provides accurate knowledge of the distribution of typhoid fever in Denmark; gives adequate control over the patient who is under the supervision of the Board of Health until the stools are found free from typhoid fever bacilli; and improves the accuracy of the typhoid fever statistics.—P. H. Andresen, State Serum Institute, Copenhagen, Denmark.

LABORATORY

JOHN F. NORTON, PH.D.

A LOW-TEMPERATURE INCUBATOR

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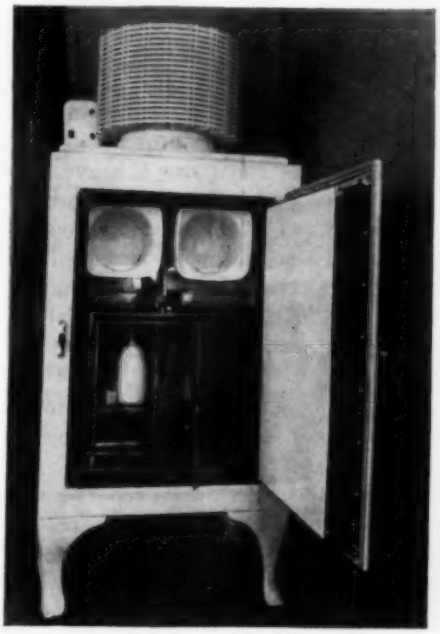
CONTROLLED incubation at levels below room temperature is required in several types of scientific work. The low-temperature incubators in use are of the water circulating type, with an ice chamber and water-jacketed working compartment. This type is useful in water control laboratories for incubation at 20° C. for gelatine culture work, and for operating at temperatures ranging from 10° C. to 25° C. or above. Recently a new type using electrical refrigeration has been developed.

The accompanying illustration shows a model which possesses several significant advantages. It was desired to have an incubator with which temperatures of 5° C. or lower could be maintained. A commercial type electrical refrigerator with a double cooling unit was used. A removable water-jacketed copper incubator was constructed to allow an air space of approximately 2" on all sides. The refrigerator has a device for approximate regulation of the temperature. This is adjusted for a temperature below that required. By means of an electric heating element on the bottom of the copper incubator and a thermo-regulator, the desired inside temperature can be maintained. The thermostat is of the rod expansion type and is regulated by means of a milled screw head from the outside on top of the incubator. A pilot lamp indicates when contact is made or broken.

The working compartment is provided with a cushioned glass door to allow inspection of the contents of the incubator without exposure to the warmer air of the room.



The one shown here has inside dimensions of 12" x 15" x 14". It has a temperature range from below 0° C. to 25° C. with a sensitivity of ± ½° C. A model with a single cooling unit would very likely be satisfactory if temperatures not lower than 10° C. were required. This model has proved satis-

factory during the past year in bacteriological work in minimal growth temperature determinations.

An important feature is that when low temperature incubation is not required, the copper incubator can be removed and the refrigerator and incubator used for their respective purposes. In regard to cost of maintenance, convenience, and automatic operation, it possesses all the advantages of modern electrical refrigeration over the old ice-box.

The copper incubator was built and installed by J. O. Halverson of the National Appliance Company, Portland, Ore. The electrical details are not presented here as they would vary with the size of the refrigerator and type of low temperature incubation required.

RAPID AGGLUTINATION IN TULAREMIA TESTS

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THE ready agglutination of *B. tularense* in the presence of positive serum has been noted by many workers. Hull [1] has described a rapid slide agglutination test employing a heavy bacterial suspension similar to that used by Huddleson and Abell [2] in their drop agglutination test for the detection of *Br. abortus* agglutinins. The importance of shaking in bringing about bacterial agglutination has been emphasized by Noble.[3]

In this laboratory it has been found that adequate shaking of the tubes in the ordinary routine tularemia test enables us to render a final report within about 3 minutes after setting up the test. A standard Kahn rack and tubes, or any test tube rack and tubes which will permit vigorous shaking, are suitable. The test is set up in the usual manner; it consists of a row of 8 tubes containing 0.5 c.c. each of serum dilutions ranging from 1:10 through 1:1,280, each succeeding tube having half the serum concentration of the preceding one. To each tube and a control containing 0.5 c.c. saline, 0.5 c.c. of formalin-killed antigen of a turbidity ordinarily used in macroscopic agglutination tests ($BaSO_4$ No. 2–No. 4) is added. The rack is held in both hands and shaken for 2 minutes as in the Kahn [4] test, and then gently for a minute longer.

We have found this procedure gives clumps of bacteria easily visible to the naked eye and in as high dilutions as can be brought out by 2 hours in the water-bath followed by overnight storage in the ice-chest. It requires no special antigen or apparatus and considerably expedites the reporting of results. It is also applicable to other agglutination reactions, but works especially well with *B. tularense*.

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VITAL STATISTICS

LOUIS I. DUBLIN, PH. D.

Vital Statistics in Australia—At the end of 1929 the population of Australia reached the total of 6,414,372. The rate of growth during 1929 was 1.22 per cent and for 10 years 19.2 per cent, which is probably the highest rate of increase in the world. Excess of births over deaths contributed 70.5 per cent of the total increase, and net immigration 29.5 per cent. The density of population of Australia is only 2.16 persons per square mile, and varies from 1 person per 100 square miles in the Northern Territory to 20.22 persons per square mile in Victoria.

The birth rate for 1929, 20.31 per 1,000 of population, was the lowest ever recorded. Compared with many other countries the Australian rate is low, but it is fortunately accompanied by a low death rate, giving a rate of natural increase that is equaled in few countries. Extranuptial births numbered 4.70 per cent of all births registered. The proportion of multiple births is one case of twins in every 98 confinements and one of triplets in 14,242 confinements. The average number of children per mother was 2.96, against 2.99 in 1928.

During the year, 60,857 deaths were registered, corresponding to a rate of 9.55 per 1,000 of the population. This rate was slightly above the average of the previous 5 years but nevertheless compares most favorably with other countries. The principal causes of death were: heart diseases, 15.3 per cent; cancer, 10.3 per cent; violence, 6.0 per cent; cerebral hemorrhage, 5.8 per cent; tuberculosis, 5.7 per cent; nephritis, 5.6 per cent; pneumonia, 4.9 per cent. The number of deaths in childbirth was 5.1 per 1,000 children born. The infant mortality rate for Australia (deaths of children under the age of 12 months) per 1,000 children born was 51. This rate is the lowest ever recorded in Australia and is, with the exception of New Zealand, the lowest in the world. The rate for New Zealand is 34.—*J. A. M. A.*, 96: 878 (Mar. 14), 1931.

Health Conditions in the Pacific Islands—The report of the mission entrusted with a survey of health conditions in the Pacific Islands, published by the League of Nations Health Organization, is a study of the causes of depopulation in Melanesia the correction of which will, it is hoped, provide means for the control of health in Melanesia.

According to this study Asiatic and Indian immigration was found to have a considerable influence on the disease picture. The distribution of amebic dysentery appears to coincide almost exactly with the distribution of Asiatic population. During the last 5 years Indo-Chinese labor has been introduced into the New Hebrides. A total of some 5,000 persons has been introduced and this number is increasing. Problems similar to those existing in New Caledonia and Fiji will presumably arise. In Fiji, where the Indian population is now fixed, immigration is small and indenture has ceased.

Frambesia is almost universal in Melanesia in the coastal areas. The absence of syphilis among natives and the relationship between frambesia and syphilis are important considerations in

southern Melanesia on account of Asiatic immigration. The indigenous hookworm throughout the whole of Melanesia is Necator americanus. It is extremely widespread but appears to be of little significance or importance in actual hospital statistics. It probably acts by reducing the resistance to other diseases. In most areas it is possible to cope with the situation by occasional mass treatment.

These conditions do not obtain when the causative organism is Ancylostoma duodenale. This organism is associated with Asiatic immigration. Its virulence is much more pronounced than that of Necator, it is much harder to expel, and it is not affected to the same degree as Necator by carbon tetrachloride. Filariasis is almost universal in Melanesia. It is a potent factor in economic loss. Elephantiasis, apart from the disfigurement that it causes, cripples a definite proportion of the natives and may have a minor effect on population.

It is only recently that attention has been devoted to myositis in the Pacific as a specific entity related to filariasis. The proportion of persons affected varies greatly from place to place, from 100 per cent to complete absence.

Malaria is present in northern but absent in southern Melanesia. The possibility of its introduction into Fiji or New Caledonia calls for serious consideration. Syphilis is virtually nonexistent except as a possibility of the future. On the other hand, gonorrhea is fairly common. The type of the infection is unusual in that it produces few complications and the question has been raised in some localities as to whether the disease is actually gonorrhea.

Bacillary dysentery is not the scourge that it formerly was. Tuberculosis is regarded as the most important feature in the problem of depopulation in certain of the administrations in Melanesia.

As a result of the examination of the bodies of native laborers dying at Rabaul, it has been found that 24 per cent of all indentured laborers die of tuberculosis and that pneumococcal infection accounts for an equivalent number. In other words, half the total deaths of laborers are due to pneumonia or tuberculosis.

Typhoid has not been seen in the British Solomon Islands Protectorate. It is extremely rare in Papua. It is becoming increasingly frequent in Rabaul and is engaging the serious attention of the administration. In Fiji and in New Caledonia it is a matter of the greatest importance. Measles is said to have destroyed one-third of the population of Fiji in 1874–1875 and in a second epidemic years later destroyed thousands of people, but it occurs at present without any virulent symptoms. Diphtheria is beginning to assume the characters seen in civilized countries. Scarlet fever does not seem to occur.

Students of the depopulation of Melanesia have suggested numerous causes, among them the heavy infantile mortality rate, the mortality rate at all ages from preventable disease, and the fact that the great majority of natives alternate between periods of plenty and periods of actual starvation. Medical problems of Melanesia are complicated by the low state of civilization, the belief in sorcery and the scattered nature and the smallness of the native communities.

After various experiments a central medical school was established at Fiji for the training of 40 students. The Rockefeller Foundation agreed to contribute to this a diminishing proportion of the total expenditure for 4 years.

In the matter of infant mortality it is the ignorance of the village mother that is of primary importance. The question of abortion and infanticide is a problem.

Where polygamy was the rule, certain antisocial practices have grown up since

substitution of monogany as a result of the influence of missionaries. In some tribes a woman is deserted by her husband if she becomes pregnant, because there is no other wife to carry out her domestic and agricultural duties. For the same reason a woman sometimes continues to work until she is in an advanced stage of pregnancy. Abortion is frequent from this cause and no premature infant survives among native people.

In regard to infanticide, Melanesians have for generations terminated pregnancy by the use of many plants, most of which owe any potency they possess to the presence of tannic acid; or by mechanical means, such as the prolonged pounding of the pregnant uterus through the abdominal wall. It was found that 18 mothers died in every 1,000 births; in some areas this figure was as high as 65.

Even when children are successfully born, they have to face many hazards, such as faulty feeding, early weaning, neglect and malaria. However, the activities for the care of pregnant women, for the feeding of infants, and for the safeguarding of children up to the age of puberty represent the most direct attack on the problem of depopulation observed by the mission.—*J. A. M. A.*, 96: 788–790 (Mar. 7), 1931.

Tripping and Falling Accidents—Since 1923 organized effort to get workers to work safely in New York State has been active and continuous, but the number of compensated accidents from all causes increased 72.9 per cent. There was an important exception to this general increase. During the same period, casualties due to mechanical causes decreased from 25 per cent of the total from all causes to 15 per cent in spite of the vastly increased use of machinery. This notable result was achieved only because of the forceful insistence by the State Labor Department and insurance companies that mechanical hazards had to be removed.

Tripping and falling accidents are almost invariably caused by some unsafe condition. In Greater New York, nearly twice as many people are killed by falls as by typhoid and scarlet fevers, chicken pox, measles, diphtheria and croup, all combined, and twelve times as many as by fires. In Continental United States, according to the U. S. Bureau of Vital Statistics, over 17,000 people were killed by falls last year. Every 10 years more of our people are killed by falls than our total army and navy losses in battle in all our wars since the Revolutionary War, not excluding the World War.

With over 17,000 fatalities from falls per year, 70 compensable cases for each fatality, and a cost of $410 per case—the average in New York State last year—our direct national cost for falls is over $487,900,000. Last year it cost every man, woman and child in New York State more than $1 to pay the compensation costs for the falls in only the industries under the jurisdiction of the State Labor Department. Falls in New York State industries last year placed 288 workers beyond the aid of any employment bureau by reason of deaths or permanent disability. In addition, 19,197 workers were placed on the unemployment list for a total of 621,346 weeks or an average of 52 weeks each. According to statistics for New York State, in total cost, total amount of lost time, and severity of non-fatal injuries, falls rank first of industrial injuries. In 1926, 1927, and 1928 they also caused the greatest number of fatal accidents.

Of the 1,088 persons killed by falls in Greater New York City in 1929, there were 12 from ladders, 32 from scaffolds, and 41 in building construction. There were 545, or slightly over one-half the total, on stairs, floors and

street. In the industries of the state, stairs, steps and level surfaces accounted for 63.8 per cent of the falls, 38.8 per cent of the lost time from falls, and 41 per cent of the compensation paid for falls. Slipping of foot, slipping or loss of balance, stumbling, misstepping or heel-catching, defective or broken surfaces, are the terms used to describe the chief causes of this largest group of falls which cost the people of this state $3,226,190 last year. Unsafe conditions stick out all over this group. Ladders, scaffolds and staging were responsible for 17.1 per cent of the falls, 27.3 per cent of the lost time from falls, and 28.2 per cent of the compensation paid for falls. Falls from miscellaneous elevations, such as benches, boxes, structures in construction and demolition, roofs, window and wall openings, loading platforms, balconies, etc., caused 14.8 per cent of the casualties from falls, 27 per cent of the lost time from falls, and 25 per cent of the compensation from falls. Falls into excavations, pits, and openings cause 3.3 per cent of the falls, 5.8 per cent of the lost time from falls, and 4.8 per cent of the compensation paid for falls.

The most careful analysis of the various groups into which falls are classified, and over 20 years' experience in combating this type of accident indicate that unsafe conditions instead of unsafe practices by the worker are the underlying causes of nearly all falls.—H. W. Mowery, *Safety Eng.*, Jan., 1931, p. 12.

Deaths from New York Street Accidents Decrease—New York City, for the year 1930, shows the largest decrease in deaths from street accidents for any year since 1923. According to summaries compiled by the Police Department Safety Bureau and made public by Police Commissioner Edward P. Mulrooney, the total number of children killed in street accidents decreased similarly, but the fatalities due to playing in the roadways increased from 116 in 1929 to 137 in 1930, indicating that city streets are less than ever a desirable substitute for playgrounds.

The total number of street deaths in 1929 was 1,332, while in 1930 it was 1,260, a decrease of 72. Non-fatal accidents increased from 53,450 in 1929, to 54,495 in 1930, but this increase was the smallest recorded in any year since 1923. Of these totals, the deaths of children (16 years and under) were 992 in 1929, and 939 in 1930, while for injuries only the respective figures are 39,862 and 40,819. The chief single cause of accidents continues to be "jaywalking," although this shows a decrease of 91 fatalities. Crossing the street against traffic lights, however, caused 51 more fatalities and 140 more injuries than in 1929. Reckless driving, likewise, has caused a slight increase in deaths and injuries, while collisions showed a remarkable decrease.—*Am. City*, 44: 169 (Feb.), 1931.

Infant Mortality in Porto Rico—The infant mortality rate for Porto Rico during the fiscal year 1927–1928 was 146 per 1,000 live births. During the 5-year period ending in 1928, the rate averaged 148. The highest rates were recorded in the coast towns, especially those of the west coast, and in the urban centers where the density of population is greatest. During the last 5 years the percentage of infant mortality in the west coast towns was 205; of the southern coast 164; of the northern coast 153; and of the east coast 150. In the central towns, the average was 116. Infant mortality in Porto Rico is in direct proportion to the density of population, being much greater in the urban centers than in the rural areas. The fact that infant mortality varies as to race, being higher in the negro race than in the white, partly explains the high coastal rates, since the colored popula-

tion is much less numerous in the interior than on the coast. In 1928–1929 the rate among the negroes of Porto Rico was 205 against 175 for the white population.

A factor in the high mortality of infants in Porto Rico is to be found in the loose regard in which the marriage ceremony is held in the island. Illegitimacy, as a consequence, is high, and since the mortality of infants of this class is considerably above that of legitimate children, a high rate of mortality is inevitable. In 1927–1928, the infant mortality of legitimate children in Porto Rico was 122; among illegitimate children it was 246. However, there are certain types of illegitimate children, born to parents not legally married but living together permanently, whose environment is not dissimilar to that of children born in wedlock. This explains the fact that certain places, having high rates of illegitimacy, have low rates of infant mortality; as happens in Villalba, with 27 per cent of illegitimate children, in Aibonito with 29 per cent and in Comerio and Utuado, with 25 and 28 per cent respectively. On the other hand, Santa Isabel, with 48 per cent of illegitimate children, had in 1926 and 1927 the highest infant mortality—272—in the Island, during the last 5 years.

Other factors of the Porto Rican infant death rate are indicated by an analysis of the chief causes of deaths. Prenatal, natal, and neonatal causes are relatively unimportant compared with those due to digestive disorders, diseases of the respiratory system and the communicable diseases. For example, in New York in 1924 the deaths under 1 month of age constituted 58 per cent of the total infant deaths under 1 year; while in Porto Rico they comprised but 29 per cent.

The utter ignorance of child hygiene is reflected in the fact that during the 5-year period 1923–1928, out of every 1,000 live births there were 49 deaths due to digestive diseases; 28 to respiratory diseases and 21 to communicable diseases. Of the diseases of the digestive system, diarrhea and enteritis caused 94 per cent of the deaths. The most important factor in the etiology of respiratory affections was direct contagion from older persons suffering from bronchitis and influenza. The chief diseases of the communicable group responsible for infant mortality in Porto Rico are malaria and tetanus. These two diseases caused 63 per cent of the total deaths attributable to this group. Malaria is much more common in the coast towns than in the interior. It has been estimated that not more than 6 per cent of the population of the inland towns is infected with the malaria parasite, while on the coast the average is from 25 to 35 per cent. Tetanus is, geographically, irregularly distributed.

Among the diseases of early infancy, congenital debility holds first place, having caused 86 per cent of the infant deaths in this group of diseases in 1927–1928. It is thought likely that many deaths charged to congenital debility are in reality chargeable to syphilis inherited from luetic parents. Out of 2,395 applicants for health certificates examined by the local health office of San Juan, in one year 242 or 10 per cent reacted positively to the Wassermann test. This proportion is high enough to lead to the conclusion that the infant death rate from congenital syphilis is greater than statistics indicate.—A. Fernos Iseru and J. Rodriquez Pastor, A Survey of Infant Mortality in Porto Rico, *Porto Rico J. Pub. Health & Med.*, VI: 151–193 (Dec.), 1930.

PUBLIC HEALTH ENGINEERING

ARTHUR P. MILLER, C. E.

Bay Disposal and Chlorination at Newport Beach, Calif.—The separate sewer system at Newport Beach, Calif., which provides for the sand spit lying between the bay and the ocean, is discussed. The sewage was treated in an Imhoff tank and the effluent discharged into the tidal portion of the Santa Ana River. As a result of numerous complaints of objectionable odors experiments were carried out on chlorination for odor control.

A brief description is given of the field experiments and the results of prechlorination. A chlorine dose of 10–12 p.p.m. proved to be sufficient to control the odors and the chlorine demand was reduced considerably by improvements made in the Imhoff tank.

The effluent is now discharged into the bay without further treatment but the development of the district in the vicinity of the Imhoff tank and the increased use of the bay for bathing are beginning to necessitate further treatment of the sewage.

Figures showing the average amount of hydrogen sulphide at various points of the sewer system and the results and costs of chlorination are included.—R. L. Patterson, *Sewage Works J.*, 1930, *2*, 111. From *Summary of Current Literature*, Dept. of Sci. & Indust. Res., III, 12 (Dec.), 1930.

The River as a Clarification Plant—The physical and biological effects of a river on sewage are briefly described. The amount of sewage which a river can carry without being overloaded depends on the relation of the biochemical oxygen demand of the sewage to the amount of oxygen in the river or available by diffusion from the river surface or from green plants. An equation is given from which the effect of a sewage load on a stream under normal conditions may be estimated. Solid matter affects the stream only over a short distance though its effect may be very serious. Dissolved matter may be carried undecomposed for considerable distances.

Temperature plays a great part in determining the self-purifying power of a stream. Decomposition proceeds more slowly at low temperatures than at higher temperatures. At temperatures above 20° C. it may, however, be necessary to diminish the load on the stream in order that decomposition may not proceed too rapidly for the amount of oxygen available.

The practical application of the conditions of self-purification in a stream to the problem of the necessary treatment of sewage is discussed. When treatment is necessary, a satisfactory removal of sludge is the most important point. Dams on a river improve the self-purifying power by retaining sludge and by giving more time for the decomposition of organic matter. It is essential, in considering the use to be made of a river, to treat the river as a whole. —Mahr (Address delivered before a meeting of the chief technical officials of German cities in Leipzig on Sept. 3, 1930). From *Summary of Current Literature*, Dept. of Sci. & Indust. Res., III, 12 (Dec.), 1930.

Demonstrating Proposed Treatment by Means of Miniature Plant—The water supply of Morgantown, W. Va., which is obtained from impounded

mountain and Monongahela River water, is discussed. The mountain water, which is chlorinated at the impounding reservoir, has a hardness content of approximately 15 p.p.m., and is of excellent quality. The river water, however, which is treated with lime and alum and filtered through rapid sand filters, is heavily polluted with acid mine waste water and sewage and has a hardness content frequently exceeding 300 p.p.m.

The contrast between the two waters gave rise to complaints. A report was therefore made on the possible solutions of the problem and a miniature plant, a brief description and photograph of which are given, was installed to demonstrate the various methods of treatment. Filtration of the mountain supply and zeolite softening of the river supply were recommended as the most feasible solution of the problem.—L. V. Carpenter, *Water Works Eng.*, 83: 351, 1930. From *Summary of Current Literature*, Dept. of Sci. & Indust. Res., IV, 1 (Jan.), 1931.

Lake Clusters Reveal a Florida Ground Water Supply—The appearance of salt in the well water supply of St. Petersburg, Fla., led to a survey of the geological conditions of the state, which is entirely underlain with limestone.

Peculiar conditions are caused by the formation of solution passages, sinkholes and basins in the limestone. The solution passages discharge into the Atlantic or the Gulf of Mexico. To maintain a fresh water flow toward the sea, the ground water level must be high enough to equalize, in spite of friction loss in the solution passage, the pressure of the depth of heavier sea water above the outlet level.

The causes which contributed to the reduction of the fresh water head and the consequent salting of the St. Petersburg supply and the experiences of other communities are described. The author deals with the choice of a new source of supply for St. Petersburg in the Cosme-Odessa lake region and the precautions to be taken to control hydrostatic conditions.—M. Pirnie, *Eng. News-Rec.*, 105: 402, 1930. From *Summary of Current Literature*, Dept. of Sci. & Indust. Res., IV, 1 (Jan.), 1931.

Filter for the Purification of Water—A steam generator is built in the pipe line supplying water to the filter employed for treatment of the water. Steam from the generator, which may be supplied with water from the pipe line, is used to sterilize the filter, and the condensed water produced during sterilization can run back automatically to the generator. Illustrations of the apparatus are included.—J. Muchka, Austrian P., 118, 362; *Chem. Zentralbl.*, 2: 1749, 1930. From *Summary of Current Literature*, Dept. of Sci. & Indust. Res., IV, 1 (Jan.), 1931.

Port Sanitation—The duties of a port sanitary authority are manifold and the duties of the Port Sanitary Authority at Plymouth, England, are given as an example. The sanitary inspection of ships in dock with reference to the comfort of the crew is a regular duty. The regulation of food comes under the Authority, including both imported food and that produced locally, such as oysters. The pollution of waters by chemicals and oils is studied and methods evolved for its elimination. Medical inspection of aliens is a problem requiring considerable study and close attention, as between 16,000 and 17,000 aliens arrive during the year.

The most important branch of the Authority's duties is the control of infectious diseases. Being a port of entry only 4 days from South America, 8 days from Lagos and 1 week from India—periods well within the incubation periods of yellow fever, cholera,

smallpox and plague—the prevention of introduction of these diseases is a matter of no small importance.

The inauguration of air travel has tremendous possibilities in the way of introducing diseases and quarantine stations or a bill of health from the starting port is mentioned as means to control this channel of entry.—P. B. P. Mellows, *J. Roy. San. Inst.*, 50, 11: 712–716 (May), 1930. From *Public Health Eng. Abstr.*, X, PHA, 9 (June 14), 1930. Abstr. H. A. Johnson.

On the Influence of the Wind in the Spread of Anopheles Maculipennis—Medemblik, Holland, is situated on a slip of land projecting into the Zuider-Zee in such a way that it is inclosed by sea with the exception of a sector of 90°. In studying antilarval work, it was believed sufficient to limit this activity to 3 km. around the protected area, but in this plan no allowance was made for the wind as a factor in the spread of the mosquitoes. Experiments with stained mosquitoes undertaken to prove that the presence of the remaining anopheles in the protected area was due to an invasion from uncontrolled regions indicated an influence of the wind. The observations seem to show that anopheles are carried much farther than their need of food requires; right up to the center of the area, where a dense human and animal population stops them.

Daily catches of anopheles in the center of the protected area produced about three times as many mosquitoes on days following a wind passing over the uncontrolled breeding areas than on other days when there were only sea winds.—N. H. Swellengrebel, *Am. J. Hyg.*, 10, 2: 419–434 (Sept.), 1929. From *Pub. Health Eng. Abstr.*, X, Ma, 18 (June 28), 1930. Abstr. Arthur P. Miller.

A Rat Flea Survey of the Madras Presidency—To determine the comparative epidemiological rôle of the various species of fleas in plague transmission in Madras, India, field studies were made from September, 1928, to the end of January, 1929, in three areas: Hosur, Salem District; Western Half of the Bellary District and Guntakal of the Anantapur District; and Periakulam, Kambam Valley, and Dindigul.

The sanitary surveys contain detailed information regarding each area, with particular reference to rat infestation. Rat trapping measures were instituted; fleas removed from the rats caught and examined. One feature common to the three regions was the high proportion of the *X. cheopis* flea on the rats, *X. astia* being the second most prevalent. Another feature was the insanitary condition of the houses, affording excellent rat harborage. Some Hindus regarded rat destruction as irreligious and refused permission to place traps in their houses.—H. H. King, P. V. Seetharama Iyer, N. Natarajan and P. V. George, *Indian J. Med. Res.*, 17, 1: 297–334 (July), 1930. From *Pub. Health Eng. Abstr.*, X: 4 (June 21), 1930. Abstr. I. W. Mendelsohn.

Garbage and Refuse Collection and Disposal in Austria, Germany, France and Italy—Collection methods in Europe are more refined than in United States or Canada. Garbage and refuse are protected from exposure to air and wind. There are three systems of house storage used in Germany: (1) can for each householder; (2) large cans filled by several householders; (3) individual householder service or can exchange system. Wagons are specially built auto trucks. Receiving chutes are specially constructed so that garbage cans fit exactly so that no dust, garbage and refuse come in contact with air or are scattered.

Frankfort, Germany, 460,000 population, collects daily 980 cu. yd. of garbage. Twenty-two large and 2 small

trucks have replaced 100 horse drawn wagons, and the city furnishes 40,000 cans. The new system shows a saving of 25.6 per cent over the old system; it is financed by tax of 1.75 to 1.45 per cent on rental value of each house.

Paris disposes of garbage by incineration with by-products such as clinker cement and brick. Revenue pays all running expenses and interest on working capital.

Cologne has a modern plant and utilizes metals, makes steam, brick paving blocks, etc. Revenues cover all costs.

In Italy the Beccari system of transforming garbage into commercial fertilizer is much used. Fertilizer is sold at $7 to $10 per ton.—C. M. Morssen, *Eng. News-Rec.*, 104, 3: 109–111 (Jan. 16), 1930. From *Pub. Health Eng. Abstr.*, X, GR, 10 (July 12), 1930. Abstr. A. H. Wieters.

Milk Epidemics—There has been a remarkable decrease in epidemic diseases in the last generation in Denmark. This decrease is largely in the intestinal infections, especially typhoid fever. Paratyphoid and paradysentery epidemics still occur and these are traced to milk in the majority of instances.

The greatest chance of infection of milk is in the cow shed at the place of production. Here infection may come from both the cow and man.

The diseases which may be transmitted from cow to man are tuberculosis (bovine type), febris undulans (bacillus abortus Bang), paratyphoid fever, bacillary food poisoning (e.g., by bac. enteritidis Gartner), foot-and-mouth disease, and mastitis (streptococci). Foot-and-mouth disease and paratyphoid fever (food poisoning group) are rare. Tuberculosis is of great importance. Infection with *B. abortus* (Bang) is much greater than is usually believed. In the last 2 or 3 years it occurred in greater frequency than typhoid or paratyphoid fever.

Diseases which may be transmitted from man to milk are divided into two groups: one composed of diseases of the pharynx and the respiratory tract, including diphtheria, scarlatina and angina; the other includes typhoid fever, paratyphoid, dysentery and paradysentery, which are diseases of the intestinal tract.

A streptococcus epidemic occurring in Kolding in December, 1926, and a paratyphoid epidemic occurring in Odense in October, 1928, are described in detail in this article. Only 5 milk-borne epidemics have occurred in Denmark during the last 2 years, 1 streptococcus, 2 paradysentery and 2 paratyphoid. This is remarkable in view of the fact that practically all milk consumed as milk is in the raw form. About 90 per cent of the milk produced in Denmark goes for the manufacture of butter. This milk is pasteurized.—Thorvald J. M. Madsen, *Pub. Health* (London), 43, 6: 168–174 (Mar.), 1930. From *Pub. Health Eng. Abstr.*, X, Mi, 23 (Aug. 19), 1930. Abstr. P. R. Carter.

Moulds Utilized to Make Sewage Sludge Inodorous—A description is given of sewage sludge treatment at Atlantic City, N. J. The sewage is settled in plain sedimentation tanks with a detention period of 30–45 minutes and the fresh solids are pumped on to sludge drying beds. The sludge, when dried sufficiently to permit shovelling, is removed, air-dried on land or under sheds and then stored in dark buildings. During storage, moulds, which are claimed to render the sludge finally inodorous although a musty odor is present during treatment, grow throughout the sludge even in winter.—C. G. Wigley, *Pub. Works*, 61: 38, 1930; *Pub. Health Eng. Abstr.*, July 26, 10, S, 80, 1930. From *Summary of Current Literature*, Dept. of Sci. & Indust. Res., IV, 1 (Jan.), 1931.

INDUSTRIAL HYGIENE

EMERY R. HAYHURST, M. D., PH. D., AND LEONARD GREENBURG, M. D., PH. D.

A Review of the History of Silicosis on the Witwatersrand Goldfields—The gold bearing area, where mining operations are carried on upon a large scale in silicious rock of "phthisis-producing" type, extends for some 30 miles on either side of Johannesburg, and is composed of a quartz comglomerate (silica, silicates, pyrites) with free silica in the original ore at 75–80 per cent. Dr. McCrae's classical paper on "The Ash of Silicotic Lungs," published some 16 years ago, showed that the mineral particles present were practically all under 5 μ and 70 per cent were under 1 μ in size.

The history naturally falls into 4 periods:

1. The initial period of gold mining on the Rand, from 1886 to 1899, that is, from the date of the first discovery of the reef until the outbreak of the South African War. One may fairly call this period, so far as local conditions are concerned, a period of ignorance of the dangers of silicosis.

2. The period of first realization of the menace of silicosis and of tentative preventive measures, from 1901 to 1910.

3. The period of the introduction of a legal system of compensation for the disease, and of the trail of more systematic preventive measures, from 1911 to 1916.

4. And, finally, what one may call: The period of the "present-day" system of fully systematized measures of prevention, detection, and compensation, from 1916 to the present time.

As a mining field the Witwatersrand today stands unequalled as regards the scale on which operations are carried on, the depth the workings have attained, the organization involved, and the extent of the precautions taken to prevent miners' phthisis. Visible dust underground is as rare as it once was common; exposure to fumes from blasting if occurring at all is accidental; and sustained efforts are being made to provide improved ventilation.

At the present time there are 45 mines of which 9 are small tribute companies. The number of European miners employed is over 10,000, and of underground colored employees over 147,000. The tonnage hoisted is over 36,000,000 tons per annum, practically all of which is broken by rock drills. The average stoping depth is 2,700 ft. The maximum depth attained is 7,638 ft. (Oct., 1929).

The combined operation of "dry" methods and "wet" methods of dust prevention since 1916 has resulted in an immense reduction of the quantity present by weight of dust in mine air, e.g., in 1915, 27 per cent of samples of air showed above 5 mg., which was reduced to 1.4 per cent in 1927. The "new Rand miner" is the man who has been carefully selected by physical examinations and supervised since 1916 and he now numbers 54 per cent of the whole body. Necessarily the incidence of silicosis has materially decreased, from an average of 3.5 per cent in 1917–1920 to 1.76 per cent in 1928–1929. The attack rate of silicosis among all miners from 1920 to 1923 was 5 per cent but among the "new Rand miners" in the tenth year of their service it was 1.3 per cent. During the past year silicosis was first detected among miners after 12 years' duration of exposure.

It is now urged that "wet" methods of dust allaying be replaced where possible by "dry" methods because of the apparent tendency of the former to increase the rate of tuberculosis. Other hazards confronted are high temperatures with high humidities, and the comparative ineffectiveness of water sprays to remove, from the air, particles of dust which are under 5 μ in diameter.

It is likely that the mines will continue for 20 or more years with other virgin ground possible, so that the fight against phthisis must be continued for many years, realizing, of course, that mechanical methods, replacing hand methods, may become an important factor not only in the reduction of the disease but in the reduction of the manual labor necessary.—L. G. Irvine, A. Mavrogordato, and Hans Pirow, *Internat. Silicosis Conference, Johannesburg, August 13–27, 1930* (Internat. Labour Off.), 33 pp. E. R. H.

The **Measurement of Skin Temperature in Its Relation to the Sensation of Comfort**—These experiments were undertaken in order "to find an objective physiological criterion for the determination of comfortable environmental conditions for human beings." In all, 4 subjects, 2 male and 2 female, were utilized in these experiments. Additional observations were made on the investigator, a female.

The apparatus employed for skin temperature determinations was of the thermoelectric type. Skin temperature observations were made on the forehead, the two cheeks, the sternum, and a point over the carotid artery. The subjective sense of comfort was classified by the subject on a basis of 1 to 5; 1 being uncomfortably cold, 5 uncomfortably warm, and 3 corresponding with the optimum condition of comfort.

The forehead temperature of the 4 subjects when they experienced conditions which they considered optimum from the point of view of comfort ranged from 32.6 to 34.2° C. The temperature of the skin measured over the carotid artery varied from 32.2 to 34.0° C., under like conditions. When the subject felt warm the forehead temperatures varied from 35.1 to 36.2° C., and the temperature of the skin measured over the carotid artery varied from 35.2 to 36.2° C. On the other hand, when the subject felt uncomfortably cold, the forehead temperatures varied from 32.2 to 32.3° C., while the carotid temperature varied from 31.2 to 31.9° C.—Emma France Ward, *Am. J. Hyg.*, XII, 1: 130–154 (July), 1930. L. G.

Transactions of the Industrial Health Section, 1930—At the Congress held in Pittsburgh, Pa., September 29–October 2, 1930, the officers of the Industrial Health Section were W. A. Sawyer, M.D., Eastman Kodak Company, Chairman, W. A. Colcord, M.D., Carnegie Steel Company, Vice-Chairman, and C. O. Sappington, M.D., National Safety Council, Secretary. L. R. Thompson, M.D., U. S. Public Health Service, was Chairman of the first two days' sessions, C.-E. A. Winslow, Dr.P.H., Yale University, of the third day's session, and Grace M. Heidel, R.N., New York Central Railroad Co., of the fourth day's session.

The papers presented and their authors were as follows:

Health Records in a Small Plant—*John H. Holzbog*

Coöperation Between Worker and Management in Health Programs—*C. O. Sappington*

Focal Infection and Its Relation to Fatigue and Industrial Accidents—*Nils Juell*

A Symposium, Qualifications of the Industrial Physician:

- The Viewpoint of the Educator—*H. F. Smyth*
- The Viewpoint of the Industrialist—*William G. Marshall*
- The Physician-Administrator—*T. Lyle Hazlett*
- The Viewpoint of the Health Department—*Albert S. Gray*

Poisons of Industry—*William S. Wadsworth*
Correct Feeding, Its Value to Industry—*Katherine Pritchett*
Relation of Industrial Health to State Departments of Labor and Industry—*Elizabeth B. Bricker*
Accidental Sickness—*Charles S. Prest*

INDUSTRIAL NURSING SECTION

Organization and Administration of Industrial Health Units—*Glenn S. Everts*
The Nurse in a Small Plant—*Wilhelmina A. Carver*
Viewpoint of the Management—*Oliver G. Browne*
Educational Program for Industrial Nurses—*Violet H. Hodgson*

A valuable discussion follows each paper.—National Safety Council, 19th Annual Safety Congress, *Special Monograph*, pp. 137–215. E. R. H.

Histopathology of Different Types of Electric Shock on Mammalian Brains—In this study sub-lethal electric shocks were administered to laboratory animals, after which the brains were removed and studied histologically. It was found that the nature of the lesion depended, to some extent at least, on the nature of the current used. The author's conclusions are as follows:

1. Electric shock when passed through the head produces lesions in the brain.
2. There is a correlation between the type of lesion and the electric wave form.
3. Heat plays but a minor rôle in the production of these lesions.
4. The intracranial vascular changes during a particular type of shock are consistent with the type of lesions produced by such shock.—

Raymond Morrison, M.D., Arthur Weeks, and Stanley Cobb, M.D., *J. Indust. Hyg.*, XII, 9 and 10 (Nov. and Dec.), 1930. L. G.

The Effects of Lead on the Vision—This contribution discusses the literature with reference to the effects of lead on vision, and presents references to 5 cases of lead poisoning with associated eye disorders, from the author's experience. One of these cases, that of sub-hyaloid hemorrhage, is presented in some detail.

The author concludes that mere association of the two disorders, that is, lead poisoning and ocular disturbances, is no proof of casual relationship. He feels that there is no positive proof in the cases reported that lead was the agent responsible for the eye lesions.—Frank G. Pedley, M.D., *J. Indust. Hyg.*, XII, 10 (Dec.), 1930. L. G.

Rational Method for Calculating Records Obtained by Means of Owens' Jet Dust Counting Apparatus—The Owens' dust sampling instrument is a small portable type instrument having a very high efficiency for dust collecting. The present report deals with a study of the distribution of dust particles on the records with a view to ascertaining the proper technic to be employed in the making of dust counts so that they may be reported in millions of particles per c.c. of air.

In this study the distribution of particles on the cross-section of the record, as well as on the longitudinal section, and also at the dense ends of the section, has been studied. As a result of this study it is concluded that the actual length of the record need not be counted, since these are very close to 1 cm. in all cases; that the dense dust area at the ends of the strip need not be counted but instead that from 5 to 10 triangular areas of each record be counted which, by a mathematical process, may be converted over into numbers of dust particles per c.c. of air.—Dr. M. Kagan and Dr. W. Broumstein, *J. Indust. Hyg.*, XIII, 1 (Jan.), 1931. L. G.

Report of the Medical Officer of Industrial Hygiene for the Year Ended December 31, 1929—The report of the Medical Officer of Industrial Hygiene is always an interesting docu-

ment, and the present one is no exception to this general rule. A report is presented on the examination of 500 coal miners from the viewpoint of silicosis.

During these examinations much valuable information was accumulated on the subject of miners' nystagmus. The subject of bakers' dermatitis received some attention since approximately 20 cases were encountered during the present year. The problem of the lead hazard and hygiene in the accumulative factories continues to command considerable attention. Dr. Badham recommends that no overtime be permitted in lead processes; that only persons over 18 years of age be so employed; and that a monthly medical service be inaugurated.

Other interesting activities of the bureau during the past year include studies of arsenic poisoning, spray painting, ventilation, dust in the sandstone industry, and one investigation into a newer industrial hazard, namely, the use of X-ray machines in shops or other industrial places. This last investigation indicates that there exists a very definite hazard to machine operators, owing to insufficient protection against rays leaking through the machine walls. There is little doubt that the Division of Industrial Hygiene of the Department of Public Health, New South Wales, continues to make excellent contributions to the field.—*Report of the Director-General of Public Health, New South Wales, for the Year Ended 31 December, 1929.* L. G.

Pneumonoconiosis and Tuberculosis—This is a review of the whole subject of pneumonoconiosis and tuberculosis in approximately 80 pages divided into 7 portions as follows: (1) An Historical Résumé of Pneumonoconiosis, (2) Types of Dust, (3) Pathology, (4) Diagnosis, (5) Prognosis, (6) Relationship between Tuberculosis and Pneumonoconiosis, and (7) Prophylaxis and Treatment.

It is quite impossible in a brief abstract to do justice to the paper, since in itself it is an interpretation and very complete summary of all the important contributions in this field.

Any one who is interested in the problem of dust and its effects will find this an invaluable reference work. The paper concludes with a bibliography of 238 references.—Henry Stuart Willis, *Medicine*, 4, 4 (Dec.), 1930. L. G.

Examination of South Coast Coal Miners for Fibrous Diseases of the Lungs—The Coal Commission required medical opinion concerning the practice of stone dusting. It was therefore desirable to determine what was the present incidence and characters of fibrosis of the lungs in coal miners as a scientific safeguard against assessing all future cases of fibrosis to the practice of stone dusting.

About 500 coal miners were examined. A marked incidence of fibrous disease of the lungs was found in one pit, and already some 12 miners have been compensated for this condition, for such disease not being due to silica dust comes under the Workmen's Compensation Act of 1926. The results of this investigation will be published.—Charles Badham *et al.* Extract from the *Report of the Director-General of Public Health, New South Wales, for the Year Ended 31 December, 1929*, p. 55. E. R. H.

Bakers' Dermatitis in New South Wales in 1929—During the investigation of 20 bakers with dermatitis, it was found that the individuals were of the allergic type and sensitive to most of the chemicals and proteins met with in the course of their work.

Routine testing was carried out with wheat flours, malt wheat flour, ammonium persulphate, ammonium chlo-

ride, treacle, malt extract, dried yeast and potassium bromate. It was found that all the bakers who had suffered from dermatitis had been using yeast foods or accelerators containing ammonium or potassium persulphate and that the outbreak of dermatitis followed a few months after the introduction of this chemical in yeast foods, a practice new in Australia.

Water suspensions or solutions of whole products were used in testing. A typical subject, when tested, shows a marked wheal and erythema to most of the substances mentioned above, particularly malt wheat flour, while the reaction to ammonium persulphate in 5 to 10 per cent solutions is a great wheal and marked erythema which persist often for days, whereas the other reactions disappear within an hour or two. Often the testing lights up a resolving dermatitis. A 1 per cent solution applied over a few minutes does not produce a marked reaction.

Individuals unaffected by dermatitis have not reacted to these substances. Does the practice of bleaching flours have any bearing on this question? A critical appreciation of the results so far obtained will be published later, but one is tempted to forecast that bakers' dermatitis in Sydney in 1929 resulted from the unfortunate association of allergic individuals with aqueous solutions of persulphate.—Charles Badham *et al.* (see previous abstracts). E. R. H.

The Use of X-ray Machines in Shops or Other Industrial Places—It was found that in the use of X-ray machines in boot departments of several city shops the erythema dose which might produce burns to the customer was over 25 minutes where all the rays come through a lead glass covering the screen, but that a leakage around the screen might lead to a burn in a shorter time. As the exposure when fitting a shoe is generally well under a minute there would appear to be little danger unless the use were repeated on successive weeks.

The machines however revealed a very definite hazard to the operator, particularly from insufficient protection from leakage around the screen.

It was therefore recommended: (1) that all X-ray machines in shops or other industrial places should be licensed after testing and inspection by the Board of Health; (2) that the present machines be immediately protected to the satisfaction of the Board of Health; (3) that in the case of machines used for shoe fitting, a notice be posted warning customers that their feet should not be exposed for more than 3 minutes in any one month, and that the use of the machines to search for needles and such like bodies is dangerous.—Charles Badham *et al.* (see previous abstracts).

E. R. H.

Chronic Lead Poisoning in Infancy and Early Childhood—The Metropolitan Life Insurance Company, as a result of a recent inquiry among prominent pediatrists, calls attention to the large number of cases of lead poisoning occurring among infants and children. The brief note points out that a Boston physician reports 50 cases of lead poisoning among children at a Boston hospital during the past 6 years. In these cases the diagnosis was proved beyond doubt, the source of lead being the paint on cribs, woodwork and toys.

It seems obvious that the simple precaution of using zinc paints in these cases should be resorted to. Lead poisoning due to the use of nipple shields and of lead ointments on the breasts of mothers was also considered a source of poisoning by the physicians interviewed. —*Stat. Bull.*, Metropolitan Life Insurance Company, 11, 10: 4 (Oct.), 1930.

L. G.

FOOD, DRUGS AND NUTRITION

WALTER S. FRISBIE

Physiological Effects of Diets Rich in Egg Whites—Previous experiments on the physiological effects of various diets rich in protein showed that cooked, dried, commercial egg white is unsatisfactory for growth, reproduction, and lactation. In this paper a further study is reported of the effects of diets rich in egg whites. The egg white used included both a commercial dried, Chinese product, and egg white from fresh eggs. The egg white was cooked in various ways and a table shows the composition of the rations.

Albino and hooded rats were used as experimental animals. A nutritional disorder and death speedily result in young rats weaned from stock rations when fed diets rich in egg white, either cooked or raw, dried or fresh. It was found that as little as 5 per cent dried liver fed 3 days before the beginning of the egg white diet protected the rats from these symptoms.

On a ration containing 66 per cent of dried egg white, either raw, Chinese, or from raw, fresh eggs, pellagra-like symptoms later developed in the rats surviving the first few weeks, even though the rations contained 20 per cent of potent dried yeast. These symptoms were prevented or cured by 20 per cent of dried beef liver but not by 10 per cent. Lard and raw linseed oil were not effective either in preventing or curing the symptoms.

The results noted in this paper confirm previous reports suggesting caution in the use of as large quantities of raw egg white in invalid feeding as has been the common practice in many hospitals in the past. Furthermore, the fact that many cases of eczema in children have been observed to be associated with a sensitization to egg white raises the question as to whether the early introduction of egg white into the somewhat restricted dietary of the child may perhaps need to be safeguarded with protective foods in somewhat the same way as its introduction into the diet of the rats in the present experiments.—Helen T. Parsons, coöperating with Eunice Kelly, *J. Biol. Chem.*, 90: 351 (Jan.), 1931.

The Destructive Action of Finely Divided Solids on Vitamin A—The purpose of the investigation here reported was to gain some information on the destruction of vitamin A which has been found to occur on standing. A vitamin concentrate of cod liver oil was used throughout the experiment. Fourteen powdered materials of different chemical constitution were used for the mixtures with vitamin A.

A table shows the destruction of vitamin A at different storage periods. From this table it is concluded that (1) destruction of vitamin A is general with all the powders though the rate of destruction varies; (2) the degree of destruction is the same regardless of whether the mixture is stored under carbon dioxide or air; (3) the destruction is progressive.

In view of the lability of vitamin A to oxidation, it was assumed that the destruction was due to the air adsorbed on the large surface of the powders over which the vitamin was distributed. To test this assumption, an experiment was made with nuchar, and it was found that

over 90 per cent of the vitamin was destroyed within 3 hours after mixing with the nuchar. A further test was made by removing the oxygen from nuchar and then determining whether the anaerobic char would protect the vitamin. It was found that the reduced char was as destructive as before treatment.

Experiments were also carried out with granulated lactose containing water and hydroquinone. The hydroquinone exerted a marked effect on the vitamin destruction. Only 5 per cent of the vitamin was lost in 15 days compared with 90 per cent lost in half that time when hydroquinone was absent. However, in 45 days the loss rose to 40 per cent, indicating that the inhibiting action of hydroquinone is temporary. Water was found not so effective as hydroquinone in reducing the loss of vitamin A. The author has further experiments under way to extend his knowledge as to the destruction of vitamin A.—Joseph Keats Marcus, *J. Biol. Chem.*, 90: 507 (Feb.), 1931.

The Mineral, Nitrogen and Fat Content of Some Varieties of Mature Bean Seed and of String Beans—The purpose of this work was to ascertain the copper, manganese, zinc, and iron content of some of the more common varieties of seed and string beans but it was found that only a few varieties had been analyzed for mineral matter. A table is given showing the analyses of 12 different samples, namely, navy, wax, pinto, great northern, lima, red kidney, white kidney, Burpee stringless, cut short, Kentucky wonder green beans, and Kentucky wonder edible hulls.

The mineral content of the different varieties was found to be high and rather uniform. The maximum ash content occurred in the seeds and hulls of Kentucky wonder string beans. The maximum phosphorus content was also found in the Kentucky wonder green beans. This same sample contained approximately 3 times as much sulphur as any of the other samples. These different varieties of beans were found to be fairly well supplied with copper, manganese, zinc and iron.

It has been previously reported (Sherman, H. C., *Chemistry of Food and Nutrition*, 3d ed., 1927, p. 400) that in 1908 and 1909 when beriberi was at its worst among the Philippine Scouts the disease disappeared as a result of adding dried beans to the ration.

Experiments, performed largely upon fowls, have shown that while beef has some effect in preventing beriberi, an equal weight of beans is much more efficacious. It is probable that the curative property of beans for beriberi is associated with their high mineral content.—J. S. McHargue and W. R. Roy, *J. Nutrition*, 3: 479 (Mar.), 1931.

The Effect of the Use of Mineral Oil upon the Absorption of Vitamin A—Previous experimentation has purported to show that mineral oil in the diet interferes with the absorption of vitamin A. If this is true, its use should be restricted, and the present experiments were conducted in further study of this effect to determine the value or perniciousness of mineral oil as a laxative. Two experiments were made.

In the first part of the first experiment, rats which were late in developing xerophthalmia due to a change in the stock diet, and which weighed 190 gm. on the average, were given 1 drop of cod liver oil and 0.25 c.c. of mineral oil daily mixed with the basal diet. The mineral oil constituted approximately 2½ per cent of the diet. Of 9 rats given this diet, 1 died from infected hydronephrosis.

Eliminating the 1 rat, the average weekly gain of the rats receiving the mineral and cod liver oil was 16 gm.;

of those receiving the cod liver oil without the mineral oil, 17 gm.; and those receiving the mineral oil with the addition of vitamin A lost 19 gm. weekly. To 1 of these rats, after a loss of 40 gm. in weight, a drop of cod liver oil was administered daily, no other change being made in the diet. Response was slow, but during the second week the cod liver oil produced a gain of 30 gm.

In the second part of this experiment, the test was repeated using more nearly standard rats—those depleted of vitamin A in 5 to 6 weeks and weighing 110 gm. The amount of mineral oil administered varied from 0.25 c.c. to 0.75 c.c. Of 5 rats fed 0.75 c.c. of mineral oil daily, the average gain was 2.6 gm. The controls receiving cod liver oil in the same amount but without mineral oil showed an average daily gain of 2.5 gm.

In the second experiment, 8 rats were used which had previously been depleted of vitamin A and which were receiving at the time of the experiment sufficient vitamin A to make gains of 2 or 3 gm. daily. Litter mates receiving the same vitamin A containing extract and which had made similar previous gains were used as controls. Five per cent of mineral oil was added to the diet of the experimental rats. Of the 5 rats given mineral oil, 4 died within a month, the fifth only maintaining its weight, probably due to its having previously stored more vitamin A in its tissues. The controls, however, continued to gain very slowly, indicating insufficiency of vitamin A.

From this it seems that rats getting only sufficient vitamin A to maintain their weight are unable to survive when given mineral oil. From these experiments it appears that rats receiving an adequate supply of vitamin A are not noticeably affected by the addition of mineral oil to the diet but that rats receiving barely sufficient vitamin A to produce a subnormal growth are adversely affected. If the amount of vitamin A administered is adequate, mineral oil may be given without noticeable effects. It is suggested that if mineral oil is employed it should be accompanied by a generous amount of fat-soluble vitamins.—Jennie I. Rowntree, *J. Nutrition,* 3: 345 (Jan.), 1931.

The Effect on Foods of Fumigation with Hydrogen Cyanide—This covers the experience of the foods laboratory of the ministry of health and the work of others in connection with the retention of hydrogen cyanide in foodstuffs after the use of that substance for fumigation purposes. While possessing no germicidal or fungicidal properties, hydrogen cyanide is admirably suited to most of the requirements of an ideal fumigant for the destruction of rats, moths, weevils, and other vermin and insects in such locations as the holds of ships. It exerts no deleterious action on fabrics, painted objects or metals, is highly efficacious and is readily dispersed.

Three objections attend its use—the lack of a definite characteristic odor or other warning property, its high toxicity for man and the domestic animals, and its entry under some conditions into foods in amounts that may cause harm to the consumer or cause the decay of the food.

The amount of hydrogen cyanide constituting the threshold of danger to man cannot be fixed with definiteness. As little as 10 mg. per 100 gm. of food is cited as a possible harmful quantity. The author cites many instances of foods containing a higher amount of hydrogen cyanide than this possible minimum.

Dates, figs, honey, cocoa, bacon and sausages (all foods with a high moisture content), tested after having been aired 24 hours after fumigation, have proved to contain from 278 to 890 p.p.m. of hydrogen cyanide to air.

Fumigation by means of hydrogen cyanide carried out in excess of requirements, particularly when used on fresh fruits or vegetables, may lead to commercial destruction or damage by interference with normal respiratory processes, or by the modification of characteristic odor or tastes. The danger of hydrogen cyanide poisoning of foods stands in relation to the quantity of gas, the duration of application, the moisture content of the foods, the size of the particles or units of foods, methods of packing, and the period of ventilation after fumigation.

Foods treated with not more than 1 volume of hydrogen cyanide in 200 volumes of air, with subsequent exposure to the air, do not usually contain more than 20 p.p.m. of the intoxicant to the food products. Computation of hydrogen cyanide concentrations in fumigation are usually reckoned in terms of the weights of the liquid or solid hydrogen cyanides per unit of space fumigated. This is in contrast to methods usually employed with some other liquid intoxicants (such as benzene), for which computations are based on parts of the gas formed on evaporation, having a vapor pressure equal to air under given conditions of temperature and barometric pressure. Relative toxicities are thus not always obvious in such terms as "parts per million."

The final estimate as to practical hazards entailed is indicated in the prefatory note by Sir George Newman, which says in part:

> If the process is skillfully applied and due precautions are taken to prevent excessive absorption of gas, it would seem that no serious risk to health is likely to be involved. It must, however, be emphasized that indiscriminate treatment of food with hydrogen cyanide by inexperienced operators may be fraught with real danger to themselves and to the eventual consumer of the food.—

G. W. Monier-Williams, *Reports on Public Health and Medical Subjects, No. 60,* Abstr., *J. A. M. A.,* 96: 635 (Feb. 21), 1931.

CHILD HYGIENE

RICHARD A. BOLT, M. D., DR. P. H.

THE Section on Medical Service of the recent White House Conference on Child Health and Protection * has made such a notable contribution to our knowledge of the resources available for child hygiene throughout the country that its findings should be brought at once to the attention of all those working for the welfare of the child. A follow-up committee of this Section has been authorized by Chairman Wilbur

> . . . to get over to the country at large as quickly as possible the importance of applying the knowledge we already possess and for which machinery exists; to consider all the implications of the reports; to determine definitely where further studies are required and to stimulate them; to determine the avenues through which the recommendations made by the Section can be most effectively put over and to determine the soundness of the methods employed in applying the knowledge we have.

It is timely, therefore, to place before the readers of the *Journal* some of the outstanding findings and recommendations of the Medical Section. The Committee on Prenatal and Maternal Care presented a very complete report, the general recommendations of which are as follows:

1. That there be improvement of obstetrical teaching of physicians and nurses.

2. That there be encouragement of postgraduate teaching of obstetrics, both in courses of 3 years' duration or less, by lectures and discussions in county, district and state society meetings and by means of extension courses.

3. That the publication be encouraged of more papers in medical journals on obstetrical subjects, especially regarding the nature and need for maternal care.

4. That there be urged the licensure, education, annual registration and supervision of midwives in those states where midwives are attending confinement cases.

5. The adoption by all hospitals admitting obstetrical patients of the minimum standards for general hospitals caring for obstetrical patients as outlined in the American College of Surgeons Year Book for 1927.

6. That all obstetrical hospitals and nursing homes be licensed and supervised.

7. That professors and instructors of obstetrics continue to emphasize in their teaching and practice the necessity for conservative measures in obstetric delivery and warning against surgical interference without consultation.

8. Continued education of the laity to the necessity of adequate prenatal, intranatal, and postnatal care in obstetrics, and to the danger of abortions, toxemias, and infections.

9. That there be a joint committee on maternal welfare representing those national organizations having active maternity programs for the purpose of close correlation of the programs, agreement as to standards involving medical, nursing and other professional procedure, principles of organization and methods of application.

10. That national agencies agree on the content of a complete maternity program, as outlined in the complete report.

11. That national agencies review their opportunities to assist in maternal care programs, as suggested in the complete report.

12. That each community be encouraged to provide adequate facilities for maternal and neonatal care.

SUGGESTED OUTLINE OF A MATERNITY PROGRAM PART OF A GENERAL PUBLIC HEALTH SERVICE

Purposes:

Education of community in nature and need of prenatal, delivery and postpartum care.

Provide adequate medical, social and nursing care, whether in home or hospital, for these periods.

* For full report of proceedings see *Official Proceedings of the Section on Medical Service of the White House Conference on Child Health and Protection, Washington, D. C., February 19–20–21, 1931*, supplement to *United States Daily*, VI, 29 (Apr. 6), 1931, Washington, D. C.

Have every expectant mother under medical supervision.

Organization:

Coördination of all agencies interested in maternity and infancy work. There are two types of organization—the official, administered by the department of public health, and the unofficial, administered usually by a voluntary nursing organization. In either an official or unofficial organization the following agencies should coöperate:

Official:

State and local health departments
State and local public health nursing organizations
Local governing board of the district
Board of Education (coöperating with general health program)

Unofficial:

Local medical and dental societies
Nursing associations
American Red Cross
Welfare agencies
Parent-Teacher Association
Federated Women's Clubs
Men's clubs
Junior League
Church groups

Health Center:

Hospital, if possible
Standard equipment and supplies
Standard record forms
Prenatal
Infant
Preschool

I. *Prenatal Care:*

Medical:
Private physician whenever possible
Nurse assistant
Clinic:
Department of public health—state and local
Hospital
Private agency
Obstetrical Standards
Laboratory:
Urinalysis
Wassermann
Neisserean
Hemoglobin
Blood cell count as indicated
Thyroid—basal metabolic tests, as indicated
Dental:
Private whenever possible
Clinic
Nursing:
Public health nurse
Institutional
Qualifications
Standards for service
Center
Home visits
Social worker
Educational:
Group instruction and demonstration
Materials and outlines for course
Literature

II. *Delivery Care:*

Home—Sterile supplies and preparation of room
Physician
Nurse, private or public health
Hospital—maternity department—standards American College of Surgeons

III. *Postpartum Care:*

Medical—examination
Nursing
Breast feeding

IV. *Referring the child to:*

Pediatrician
Infant Welfare Station

ASSISTANCE WHICH NATIONAL ORGANIZATIONS MIGHT GIVE IN A MATERNITY PROGRAM

I. Stimulate interest of local physicians, dentists and nurses in the value and need of prenatal care
In close coöperation with:
State and local departments of health
State and local medical societies
State and local nursing organizations
State and local dental societies
Through:
Articles in state, medical and dental journals
Speakers at state and local society meetings
Physicians
Dentists
Nurses

II. Education of laity in nature and need of maternity care
Publicity through:
Magazines
Local papers
Extension services
Men's and women's club programs through:
State board of health
State medical associations
State public health nursing association
State dental associations
Speakers on special subjects
Articles for local newspapers
Material for local physicians who address groups
Programs for study groups

Literature:
(This probably should be provided by the state, but it seems that there should be *standard* publications on the subject for the public health agencies)
Exhibit material

III. Provide postgraduate education
1. Medical—for general practitioners
Courses:
a. Institutes—through state departments of health and state medical associations
b. Medical colleges
Prenatal care
Delivery care
Postpartum care
2. Dental
Nutrition and teeth
Advice and dental care for the expectant mother
3. Nurses
Institutes—through state division of public health
Nursing and state nurses associations
Maternity care
Infant care
Teaching prenatal care to groups
Outlines for group instruction
Demonstration material

IV. Improving type of midwives
Education
Licensing, annual registration, supervision—state responsibility
Annual refresher courses
Outlines and material

V. Stimulate interest in establishment of whole-time health units
Medical organizations
Dental organizations
Nursing groups
Governmental boards
Laity
Demonstration of complete maternity program
Bring maternity departments of all hospitals up to American College of Surgery minimal standards
Revision of stillbirth and maternal death reports
Make septicemia universally reportable

The report of the Subcommittee on Health Centers * was enlightening and gave an excellent picture of the distribution, scope and influence of health centers throughout the United States.

* Presented by Dr. J. H. Mason Knox.

NUMBER AND DISTRIBUTION OF HEALTH CENTERS

The distribution of the 1,511 health centers throughout the country, according to states from which questionnaires on health centers were returned, is as follows: New England States, 295; Middle Atlantic, 550; East North Central, 266; West North Central, 63; South Atlantic, 162; East South Central, 49; West South Central, 59; Mountain, 40; Pacific, 117.

These centers are carried on, 643 directly by official (usually municipal) agencies; 636 by nonofficial agencies and supported by voluntary funds; and 232 are called "cooperative," which means that both official and volunteer agencies are concerned with the support of the centers. The number of independent units conducting work at health centers is considerably larger than the figures indicate, as in a number of instances an organization in a large city may carry on work in multiple centers and make a single report embracing the total volume of work.

Seven hundred and twenty-five, or 48 per cent of the total number, were directed by nonofficial organizations; 729, or 52 per cent, by county or municipal departments of health; and considerably smaller percentages by the American Red Cross, various hospitals, child health organizations, case-working agencies, tuberculosis associations, etc. Many of the health centers conducted under the above auspices were in affiliation with other organizations, official or voluntary.

THE CHILD HEALTH CENTER AN APPROVED MEANS OF HEALTH PROMOTION

The child health consultation—whether at a permanent or temporary locale—is becoming an accepted means of bringing the infant or young child to an accredited physician for physical examination and advice, for the promotion of health and for the detection of disease or of bodily defects. Treatment is not undertaken in a child health center. If disease or remediable abnormality is discovered, the patient is referred to a physician or hospital for the desirable curative treatment.

The experimental stage is nearing its end. There seems to be general agreement that the periodic physical examination of the young child throughout its formative years is desirable and that the health center provides a method to accomplish this purpose for those children in families of limited means.

THE CENTER AS A HELP TO PHYSICIANS

We believe that a small proportion of the children examined at these consultations have been under regular medical supervision before, that the practice of the physicians of the community is rarely interfered with by the examinations conducted at a health center, but on the contrary that, as a result of the health center, local physicians receive at their offices many patients who would not otherwise have consulted them. Moreover these referred children in need of treatment are, on the average, suffering from less advanced disease and from less severe physical defects than would have been the case had they deferred coming until brought by their parents without the suggestion of the health center.

We believe that the centers or conferences should receive only infants and children supposedly well and that sick children and those in need of corrective treatment should be referred promptly to physicians or hospitals.

PREVENTIVE CARE A COMMUNITY RESPONSIBILITY

The majority of the children brought to the average health center are from families of limited means. We believe that a determination of their physical condition and the furnishing of advice in health matters is as much a community responsibility as is the offer of free elementary education. The latter is frequently hindered or nullified because the physical or mental status of the pupil has not been ascertained.

As has been true in other kinds of philanthropic endeavor, the first child health centers were the result of the vision and interest of private individuals or various charitable organizations, industrial plants, hospitals, and similar groups. This accounts in part for the many variations in the emphasis which is placed upon certain forms of activity carried on in different centers and for the variation in the composition of the staffs. Each has developed as the special needs of the child population of the given community impressed the patrons.

This method of development in the main has been of advantage, for it has led to the trial of many forms of service in the centers, the value of which could only be determined by experience.

It would appear that further attempts should be made to set up certain standards of operation in order that the work of the many centers may be comparable.

Gradually the wisdom of expending public money for this purpose, either as grants to existing centers or for the establishment and maintenance of child health centers or consultations as part of a public health program, has been recognized.

In addition to the 6,198 child health centers and the numerous itinerant conferences maintained by the bureaus of child hygiene, 693 of the 1,511 permanent centers studied by our committee receive their principal support from public funds. Many others receive part of their support from the same sources.

RELATION WITH HEALTH OFFICIALS AND COMMUNITY ORGANIZATIONS

Our studies indicate that even where the centers are established and maintained by private funds they very generally coöperate actively with neighboring agencies operating in the fields of health and social service. We believe that it would be advisable to go further and make each health center a coördinated part of a public health program with the coöperation, or under the supervision, of the local official health agency, certainly in those instances where there is a full-time health officer responsible for health conditions in his territory. Such an official should use the center or the consultation as far as practicable in determining the physical condition of the young children who are not under the regular care of their own physicians. This official use of the center will broaden its work and make it of greater value in improving the sanitary standards of the child population.

PUBLIC HEALTH NURSING

EVA F. MACDOUGALL, R. N.*

This **Will Help the County School Nurse**—The Children's Fund of Michigan recommends the following as a simple first aid kit for rural schools:

Container: A small tin or pasteboard box with a cover. (A candy box will do)

Contents: 1. A half ounce bottle of 2 per cent mercurochrome with a rubber stopper and a glass rod 10c
(In districts where there might be objection to an antiseptic, use liquid green soap for cleansing)
2. One tube plain vaseline 10c
3. One yard of ½ inch adhesive 10c
4. One two-inch bandage 15c
5. One-half dozen safety pins 5c

Total 50c

Articles which may be contributed by the children as they become interested in the use of the kit:

1. Toothpicks for cleaning nails
2. A small brush for use in scrubbing hands
3. Blunt scissors
4. Old muslin which has been boiled and ironed with a hot iron, then wrapped in freshly ironed newspaper
5. One square yard of old sheeting for arm slings
6. Old newspapers for making a splint for a broken arm
7. A stick and a stone for a tourniquet—

A Simple First Aid Kit for Rural Schools, From Children's Fund of Michigan, *Michigan Public Health,* XIX, 1: 18 (Jan.), 1931.

Teacher Training Courses for Home Hygiene Instructors—Public health nurses are being called upon more and more to teach classes in health and hygiene. Some of the states require that each student before graduation from high school complete one unit in a health subject, and the school nurses are often asked to teach this course. The preliminary professional training of the nurse seldom if ever includes any special preparation for teaching. Some have fortunately had teaching experience before entering the profession of nursing, but that is the exception rather than the rule.

Since 1908, the American National Red Cross has organized and taken the responsibility for furnishing teachers for classes in Home Hygiene and Care of the Sick. Last year there were 3,233 classes taught in more than 1,000 different communities—2,085 of these classes were taught in the schools. Over 1,500 graduate nurses were authorized as home hygiene instructors. So few nurses are generally prepared to teach, that the American Red Cross, in order to meet its responsibility to provide teachers for the classes, has organized teacher training courses in several universities. These are given during the summer when many nurses are free to attend. Courses cover theoretical work in Principles of Teaching and also practical work in the Methods of Teaching. For those nurses who are expecting to teach classes in Home Hygiene and Care of the Sick a preparatory course of this kind is invaluable. There is an immeasurable benefit derived from being able to apply the essentials of teaching to the actual practise teaching of health subjects under the expert guidance and supervision of skilled instructors.

The Teacher Training Courses for

* Please send printed matter or other material relating to public health nursing to Eva F. MacDougall, 6 State House Annex, Indianapolis, Ind.

Home Hygiene instructors are being offered this summer at:

Pennsylvania State College, State College, Pa., June 29 to August 7 inclusive

Colorado Agricultural College, Fort Collins, Colo., July 6 to August 14 inclusive

University of California, Los Angeles, Calif., June 22 to August 1 inclusive

The course at the University of California is restricted to nurses in the Pacific Branch Area of the American Red Cross.

Many nurses keenly appreciating their need of definite training in teaching have taken advantage of these courses. Application to the American National Red Cross for enrollment in the Teacher Training Courses should be made previous to the opening of the various summer schools. HELEN BEAN

Public Health Nursing Rural Teaching Center, St. Francois County, Mo.—St. Francois County is situated about sixty miles south of St. Louis, and is in the heart of the "Lead Belt," which produces one-eighth of the lead supply of the United States. Lead mining, therefore, is the chief industry. Some farming is carried on in the northern and southern parts of the county; and tiff-digging and tie-hacking furnish employment to a few.

Although Farmington is the county seat of St. Francois County, Flat River was chosen as headquarters for the County Health Department, because it is the center of population and also the geographical center of the county. Flat River itself has a population of 8,000, but is unincorporated. The county has a population of 36,000, and covers 458 square miles.

The St. Francois County Health Department began its work in July, 1922, and consisted of a full-time county health officer, one nurse, a sanitary officer, and an office clerk. As the work has grown, nurses have been added to the staff. At present there are three staff nurses, and a chief nurse.

The county is divided into three nursing districts. The nurse in the Farmington district has office space with the Farm Bureau agent in the Court House. The nurse in the Bonne Terre District has a small building donated by one of the lead companies; and the nurse in the central district has her office at county headquarters in Flat River.

The present budget for the County Health Department is $20,000. This is contributed by the International Health Board, the Missouri State Board of Health, the county court and the two lead companies. The lead companies contribute 80 per cent of the total amount.

The teaching center was opened in Flat River in January, 1930, with Maud Tollefson as chief nurse and supervisor of student experience. Nurses of one group who are eligible for this experience in rural nursing are the students enrolled for the Washington University course in public health nursing. For this field work they receive credit toward the Certificate in Public Health Nursing. Certain other graduate nurses, especially qualified both professionally and personally, are also accepted. They must apply for admission to Pearl McIver, State Supervising Nurse of the Missouri State Board of Health. Students from either group may apply for the Rockefeller stipend of $90 a month. This has been granted to nurses who wish to do rural public health nursing in Missouri.

Since a broad generalized program is carried out in St. Francois County, the students have the opportunity to observe or participate in the following activities: writing and filing of records and reports, and other routine office work; community organization; infant and school hygiene; communicable dis-

ease control; sanitation; clinic work; group teaching, and other health education activities.

One student is assigned to each staff nurse, and lives in the district to which she is assigned. During the first 2 weeks, the student observes the work of the staff nurse, attends three 2-hour lectures a week given by the County Health Officer, Dr. W. W. Johnston, and has group and individual conferences with the chief nurse.

During the next 2 weeks the school nursing demonstrations are given by Miss Tollefson, and the students spend most of their time in school work. They are permitted to work alone as soon as they are able. During the last month the students work alone, under periodic supervision. Each is assigned definite pieces of work and is held responsible for the accomplishment of these assignments.

The demonstrations continue once a week during the last 4 weeks, and cover the other types of service in the county. Individual and group conferences are held at suitable times to give the students an opportunity to discuss the work accomplished and to ask questions. The students attend also the regular weekly staff conference and a few special lectures. One lecture is given by Dr. Emmett Hoctor, psychiatrist at State Hospital No. 4 for the mentally diseased, at Farmington.

Besides keeping the daily and monthly reports required by the State Board of Health, the students keep a field experience record of all activities: reading, lectures, conferences, observations, visits, practice, etc. Each student also works out some project of especial interest to her.

Field trips to the county institutions and other points of interest are arranged, and county officials and other coöperating agencies are visited. The last week is spent visiting the different bureaus of the State Board of Health, and other state departments and institutions, among which is the U. S. Public Health Service Trachoma Hospital at Rolla. M. T.

The Nurse in Education and Administration—The Mt. Sinai Hospital School of Nursing in New York City celebrated the golden anniversary of its founding at the New York Academy of Medicine, March 4. Laura Logan, Superintendent of Nurses of the Cook County Hospital, Chicago, a graduate of the Mt. Sinai School, was among the speakers. Her address follows in part:

The supply and demand study made by the Grading Committee for Schools of Nursing in 1928 showed that over 20 per cent of the nurses of the country were engaged in institutional nursing, over 20 per cent in public health nursing, and some 54 per cent in private duty nursing. It is known that only a small per cent of those doing institutional nursing are engaged as staff or bedside nurses.

The grading study brought to light startling and significant facts with relation to the nurse in the field of nursing education. It showed that although there is an over supply of nurses in the field of private duty and with the present annual output of over 20,000 graduates this condition of unemployment is likely to grow worse—it proved that the supply of well prepared teachers, administrators, supervisors and head nurses for schools of nursing and for the field of public health is inadequate.

The recent White House Conference strikingly showed how important a part the nurse is expected to play in the nation's program for child health and development.

We have few figures to show that a well run nursing school is cheaper than the same service rendered by a well prepared paid graduate nurse personnel but we have figures to show that a good nursing service adequate in members is an economy to the hospital, while a poor nursing service is a district liability—it shows up in the death rate, in the length of hospital stay, in the confidence and the good will of the community toward the hospital.

Society is changing its attitude toward the work of the nurse—this is measured by the rapidity with which universities are making a place for her preparation and by the importance of her place in the public health program. The nurse within the last 50 years has become a very important instrument or agent

of science in the application of its benefits to the race. It is therefore highly important that this agent, the nurse, be carefully selected, have a sound preparation in the sciences and the skills which are fundamental to good nursing. The administrators, supervisors, teachers, and head nurses in schools of nursing must not only be well prepared nurses but educated women skilled in the understanding of educational policies and of social and economic sciences, and so be able to incorporate into the training of the nurse that which will fit her especially in her professional service to society and also all that will fit her to live as a good citizen and to do her part in promoting a high quality of human life.

Endowments in universities are contributing to the preparation of professional workers no more important to social welfare than is the nurse. May we not expect from the community a recognition of need of endowment for schools of nursing and from the great body of medical men support and assistance in placing nursing on an academic and social basis comparable with other professions open to women?—News Release of the United Hospital Fund of New York, Mar. 4, 1931.

These Would Raise the Standards—The New York State Health Commission appointed by Governor Roosevelt in 1930 has presented to the Governor its preliminary report dealing mostly with health matters involving legislation. The following are recommendations in the report dealing specifically with public health nursing:

1. That county departments of health be developed throughout the state with a qualified supervising nurse under the direction of the health officer, who will teach, supervise and coördinate the work of all public health nurses employed in the county.

2. That the Department of Health be given facilities to continue and extend its efforts to promote the qualifications of public health nurses in the state.—*Health News*, New York State Dept. of Health, VIII, 7: 25, 28 (Feb. 16), 1931.

EDUCATION AND PUBLICITY

EVART G. ROUTZAHN*

Montreal, September, 1931—Education and/or publicity will be well represented on the A. P. H. A. program. The Public Health Education Section hopes to welcome many who could not get to Minneapolis or Fort Worth. The date is so early in September that some may find it convenient to plan a vacation in Canada to end with a stop at Montreal.

"For The Good of The Order"—Quite apart from the program sessions it is hoped that several small groups would like to get together at luncheon or dinner to talk over "where are we going in popular health education?" If you wish to put in a noon or early evening in such a discussion please write to the editor. Have you questions to raise as to the present or future status of health education?

Special: Cancer Education—Newspapers announce that through the will of Egbert C. Fuller a fund of $1,500,000 will be devoted to research, care of patients, and the *education of the public as to the prevention and treatment of cancer.*

Health Education in a Survey Report—The Philadelphia Hospital and Health Survey includes 7 lines in the Appraisal of Public Health Activities; 5 pages on "Educational and In-

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

formational Aspects" under "Social Hygiene"; 12 lines under "Cancer." These 3 references appear in the 6-page detailed index. Running through the pages we found 4 lines under "Tuberculosis" and 3 lines under "Placement." There were no references to publicity or popular health education in the "Recommendations" or "Summaries."

Where and How To Get It—Dorothy Kalben lists sources for securing health education matter and suggests:

> In writing for health education material, better results will be obtained by asking for a particular kind of material rather than making an indefinite general request for "material on health," "health pamphlets," etc. Often good results are obtained by writing first for samples of material, or for printed lists. *It is well to state the specific purpose for which the material is to be used as this aids the organization in selecting what to send.* For those inexperienced in this field of work, we advise first communicating with one of the local organizations listed above before writing to out-of-town organizations.—

Baltimore Health News, Health Dept., Feb., 1931. *Reprint free.*

A similar word of warning widely distributed by national, state and local agencies should reduce an immense amount of baffling and futile correspondence. The title or position of the writer, and the name of school or organization would help in many cases.

The sources in the Baltimore lists are not so fully described as might be. No one since the long ago reports of National Child Health Council has done as good a job in helping readers to know what could be secured from the different sources. This applies to lists in school education manuals—public and private—and other source lists.

An Educational Experiment—The story of a 3-month campaign among 150,000 people of a New York City neighborhood is detailed in "An Educational Experiment," by Savel Zimand (*Journal of Social Hygiene*, 450 7th Ave., New York. March, 1931. *35 cents.*) The full account should be read. The "conclusions":

> From our experience in the Bellevue-Yorkville District we find that there are certain methods of health instruction which are as applicable to syphilis and gonorrhea as they are to other menaces of public health. On the other hand, we believe that certain health educational methods have to be modified when applied to campaigns against these two diseases. We have found that there is need for active, intensive, and steady health educational work against syphilis and gonorrhea. We feel that it will be very valuable to have a special month each year set aside not only for this city but for the whole country, to carry on such campaigns against these two diseases. Our approach convinces us that by carefully planned methods we can succeed in enlisting the newspapers to coöperate consistently in a campaign against syphilis and gonorrhea. We think there is a real need for training of nurses in this field and feel that careful consideration and study should be given to this subject. Finally we are of the opinion that the educational work carried on by physicians, public health officials, nurses and other special workers, combined with popular campaigns along the lines carried on by us, will help overcome the taboos associated with the venereal diseases, with the result that syphilis and gonorrhea will come to be treated like other infectious diseases such as tuberculosis, smallpox, and diphtheria.

For samples of the excellent folders address Mr. Zimand at Bellevue-Yorkville Health Demonstration, 325 East 38th St., New York.

State Department Mailing Lists—Not all state health departments have the Library of Congress, Washington, D. C., on their mailing lists for printed, mimeographed or multigraphed publications. The result is that many items are missing from *Monthly Check-List of State Publications*, the monthly pamphlet which is the authoritative source of information on the subject. This *Check-List* is a reference tool in all

important public and college libraries.

Please check to see that the address is on lists for mailing all types of periodical or special material—reports, educational pamphlets, news, etc., etc.

HONORABLE MENTION

To National Tuberculosis Assn.: for giving date of publication on two pamphlets on school health topics.

MAGAZINE ARTICLES

Middletown, N. Y., March *Bulletin*, mentions that in *Delineator* for September Celia Caroline Cole gave some wild advice on the care of the eyes. Can you get some women's groups interested in health to write to the editor?

"The Care and Feeding of Adults," by Logan Clendening, M.D. *Collier's*. Mar. 21, 1931. "Get a doctor of your own." "How very delicate adults really are" . . . "watch a crowd around a soda fountain."

"Hard-boiled Mothers: Yesterday's Flapper as Today's Modern Parent," by Marian Castle. *Woman's Journal*, 171 Madison Ave., New York. Apr., 1931. *25 cents*. For perplexed parents—and worrying elders.

"Hold Your Horsepower"—editorial. *Collier's*. Mar. 14, 1931. "Reckless driving in 1930."

"The Influenza of 1918," by W. A. Evans, M.D. *Liberty*. Feb. 7, 1931.

"Medicine and the Middle Class," by W. M. Johnson. *Atlantic*. Mar., 1931.

"Oh, Doctor!"—editorial. *Saturday Evening Post*. Mar. 21, 1931. Few medical men "have that peculiar gift for separating simple essentials from intricate surroundings" in presenting health information.

"Secretary Wilbur and the Cancer Cure," by M. A. Hallgren. *Nation*, 20 Vesey St., New York. Apr. 8, 1931. *15 cents*. How a "cure" was patented.

"Specialists at Large," by D. D. Bromley; "The Cosmetic Urge," by Jeanette Eaton. *Harper's*. Feb., 1931.

"Tonsil Tricks," by Fassett Edwards, M.D. *Collier's*. Feb. 21, 1931. "Just what to do about tonsils baffles many of our best people."

EDUCATION—PUBLICITY

The Cancer Program in Massachusetts, by George H. Bigelow, M.D.—Committee on the Costs of Medical Care. Includes educational activities. *Free*.

"Health for Better Adventures," by Prof. C.-E. A. Winslow. *World's Health*. Oct.–Dec., 1930. Convention address to American Red Cross urging the need of wider development of Red Cross health program.

"Health Propaganda Methods," by Dr. John Macmillan. *Public Health*, London. Feb., 1931. Need for health education by health departments; evaluation of effective means.

"The Importance of Cancer Publicity," by Ella H. Rigney. 9-page reprint from *Hospital Social Service*. Description of nature, extent and results of publicity by New York City Cancer Committee, 34 East 79th St. *Free*.

"Methods and Aims of Popular Health Education in Germany," by Prof. Adam, secretary-general, Reich Committee on Popular Health Education. *World's Health*, 2, Avenue Velasquez, Paris, France. Oct.–Dec., 1930. *50 cents*. Development and extent of popular and school health education.

"The Philosophy of Health Education in the Clinic," by Iago Galdston, M.D. *Hospital Social Service*, New York. Jan., 1931. For reprint, address author, New York Academy of Medicine. Read the paper for the philosophy. The application:

> In a large number of our clinics a visiting patient is obliged to wait from 5 minutes to an hour before his turn comes. In the majority of clinics such a patient sits looking empty-eyed about him, or discussing his condition with his neighbor, or again, perhaps

reading a newspaper or a frayed magazine. How much better it were if the waiting patient could spend his time reviewing posters, graphs, charts and photographs, or looking at stereopticon views or daylight motion pictures. Instead of the frayed magazine, could we not supply him with attractive literature dealing with health? Could we not entertain him and render his wait less tiresome by showing him stereopticon views or motion pictures?

"Popular Education," by Florence B. Sherbon. *Eugenics,* New Haven, Conn. Jan., 1931. *30 cents.* Why "propaganda" (objected to by Dr. Pearl) is needed for advance of eugenics.

"Summary of a Social Hygiene Survey of Washington, D. C.," by Walter Clarke. *Journal of Social Hygiene,* 450 7th Ave., New York. Feb., 1931. *35 cents.* Under "Social Hygiene Education" a valuable review of activities in homes, public schools, churches, social agencies and adult clubs.

The Summary of Educational Methods in Mental Hygiene is being prepared for publication by National Committee for Mental Hygiene. An advance report on talks and lecture courses, in *Mental Hygiene Bulletin* (Jan.–Feb., 1931), names 22 books listed 4 or more times in reading lists given out by speakers. It is interesting that only one book was recommended as many as 12 times.

POSTERS

"Making Health Charts," by Pearl Turner. *Public Health,* Mich. Dept. of Health. Feb., 1931. "A chart is a sort of catalog or category—it is a collection of small pictures all pertaining to one subject"—such as "Foods Containing Iron." Working suggestions—but please delete "small" before "pictures." *Free.*

"Charts Make Facts Convincing," by Margaret Merwin and Helen Davis. *Public Health Nurse,* 450 7th Ave., New York. April, 1931. *35 cents* (easy to borrow a copy in your city). Here "charts" are diagrams and placard statements—not groups of "small pictures." Uses discussed: in reports and exhibits, for speeches, articles, letters, materials, lettering, titles and labels, reproduction of charts.

A "mother and baby" poster—actually a poster and not a placard—in color—sketch by Sundblom—19″ x 25″—with these words in small letters at the bottom: "Compliments of Evaporated Milk Association." *Free.* Address: 203 N. Wabash Ave., Chicago.

Safety posters—some especially good—some not so good—are supplied by Employers' Mutual Liability Insurance Co., Wausau, Wis. *Free.*

Once a month a new health or safety poster is displayed in all Western Electric plants. Better than average quality. *Copies not available.*

Both above series of posters are about 9″ x 12″. Both groups will be shown at Montreal.

Those interested in the desirability of bill-board posters for health education will wish to see *Roadside Bulletin,* Natl. Council for Protection of Roadside Beauty, 119 E. 19th St., New York. *Free.*

ANSWERS

Asked for: "exhibits that could be used at state or county fairs—especially activity exhibits." *Answer:*

There are practically no readymade exhibits available through national or other organizations. One of the very few exceptions is the U. S. Children's Bureau, Washington, D. C., to which I suggest that you write.

Inquiry:

Our Association is planning a health exhibit at two of the fairs in the county this fall. I shall be glad of any suggestions for posters along health lines or any exhibit that would be attractive for this purpose. We are planning on three departments, we might call them. One each might be periodic health examinations; prenatal work, maternal and infancy. In the third division we might use some diphtheria prevention work, vaccination work and nutrition if our space is ample.

Answer:

The job of planning the exhibits—and the bigger job of presenting them to the fair visitors would be simplified if you could content yourself with but two or even one subject.

Why not make a big splash in one subject? Pick one of the seven you mention—one that you will emphasize especially this season, the one you can exhibit most effectively.

A list of poster sources is supplied by National Health Council, 450 7th Ave., New York, for 10 cents.

Reference to the newer posters will be found under Education and Publicity, in the monthly issues of the *American Journal of Public Health*.

Under the same heading, in various issues, the *Journal* offers many suggestions on making exhibits.

Inquiry:

The Tuberculosis and Public Health Society is now coöperating with the Medical Society in arranging health talks to be broadcast over our local station. I would appreciate it very much if you could give me some suggestions as to subjects that would be desirable in such a program.

Answer:

The best source of information regarding topics and prepared talks for radio use is the Education and Publicity Department in the *American Journal of Public Health*. I think you can do no better than to go through the files for several years back.

To which was added several specific sources already mentioned in this department.

TITLES AND PHRASES

Some of these titles may suggest new slants on old topics—new ways of saying old stuff.

"The Inside of Your Head"—or "Mental Hygiene?" Which article will get the more readers?

"Are Modern Parents Failures?"—*Hygeia*. "In defense of parents."

"The Cup That Spreads Disease"—Connecticut State Dept. of Health.

"Dental Secrets of Hollywood"—*Popular Health Magazine*.

"Deprived of his birthright!"—(advertisement) Mother's milk.

"Mental Disease is Preventable." "Mental Health is Procurable."—Massachusetts Society for Mental Hygiene.

"New Styles In Health" and "It's Smart To Be Healthy"—*Better Health*, Syracuse Dept. of Health.

"The Old Oaken Bucket May Be Full of Germs"—*Hygeia*.

"One Little Whooper Starts Epidemic"—*Everybody's Health*, St. Paul.

"Physical Illiteracy"—*Hygeia*.

"Riders of the Plagues"—the story of the conquest of disease by J. A. Tobey.

"Sanitary Etiquette"—*Ohio Health News*, State Dept. of Health.

"Twentieth Century Vipers and Vapors"—quotes about health fads of 17th century. April, 1931, clip sheet, N. J. Tuberculosis League, 21 Walnut St., Newark. *Free*.

"Why Are Statistics Vital?"—*Pennsylvania's Health*, State Dept.

"Youth is the Strength of America; Make American Youth Strong"—Am. Child Health Assn.

Copies of *Hygeia* (535 N. Dearborn St., Chicago) *free*.

REPORTING

"Alaha from Phil Platt" is written on the cover of the report of Palama Settlement Work, Honolulu. Palama is somewhat like Henry Street Settlement in that it carries a city-wide nursing service; in addition it is the center for community health and recreation activities. Among interesting features of the report are: self-indexing (like unabridged dictionary); "Milestones": "For 33 years a center for free medical service to the poor"—"For 25 years provided a public health nursing service"—and so on. Probably copies on request.

A Chronological Report: Significant Events and Steps in the Organization and Progress of the Cattaraugus County and Syracuse Health Demonstrations—State Charities Aid Assn., 105 East 22d St., New York. Valuable document for students of these demonstrations.

A Day With The Visiting Nurse—Instructive Visiting Nurse Assn., Washington. A 9-fold folder—letter enclosure size. The story told in pictures with text and brief titles and plenty of white space. Dull finish paper is used. *4 cents for copy.*

Recent Progress in Health Organization in Honolulu, by Philip S. Platt, Palama Settlement, Honolulu. 8 pp. illus. *Free.*

Report of the Connecticut State Tuberculosis Commission—marked by the numerous page illustrations and the many pages of small type lists of contributions and services of various kinds.

Reporting within the family—and gleaning data from many sources is discussed in an especially helpful article—"Relating Hospital Service to Community Needs," by A. C. Philips and D. Dunker. *Trained Nurse,* 486 4th Ave., New York. Feb., 1931. *35 cents.* Many suggestions could apply to departments and other health agencies.

"Saving Life by Preventing Illness"—happy title—is "A Review of the work of the Tuberculosis and Health Society of Detroit and Wayne County for the year 1930"—51 Warren Ave., West, Detroit, 8 pp.—3¾" x 9"—rough paper—large type—readable—no statisticable tables. *Copy free.*

The Year's Progress—Philadelphia Health Council and Tuberculosis Committee—a 12-page narrative report—several illustrations—1 page financial statement including functional classification of expenditures. *Free.*

CONTESTS

Scribner's Magazine, New York, offers prizes of $1,000 and $500 for narratives of 2,500 to 6,000 words. Closes June 20, 1931. "The stories must relate to some phase of American life." Public health in some of its aspects offers rich source material for the writer.

The Hospital Committee, Raleigh Woman's Club, offers prizes for best papers by high school students on "The Value of a Hospital to a Community." Details in *Health Bulletin,* North Carolina State Board of Health. Apr., 1931. *Free.* Local clubs might sponsor essay contests on other health subjects.

Year after year the Association of Infant Welfare and Maternity Centres, London, conducts a group of contests for children, mothers and communities. A health talk by health workers was judged by medical men and by a group of mothers. Address: 117, Piccadilly, London, W. I., England.

The *10th annual* health poster contest is being conducted by the Anti-Tuberculosis Society of Schuylkill County, Pa. For high school, 7th and 8th grade students.

Two contests—training student essays, and play or pageant writing—are being conducted by American Nurses' Assn., 450 7th Ave., New York.

VOLUNTEERS

"High Voltage Volunteers—How to Get Them—Train Them—Keep Them," by J. A. Wolf. *Survey.* Nov. 15, 1930. "Only a fraction of the work in the vast field . . . could be done without volunteers."

"The Volunteer of the Junior League and Public Health Nursing"—"County Volunteer Service"—"The New Volunteer." 3 articles on the great untapped resource for public health work. *Public Health Nurse.* Mar., 1931.

NEW

Bulletin, Pennsylvania Heart Assn., Philadelphia.

American Journal of Orthopsychiatry, 145 E. 57th St., New York.

BOOKS AND REPORTS

Child Health—*By Norma Selbert, R.N. Philadelphia: Saunders,* 1931. 239 pp. Price, $1.60.

This volume is a companion to the author's book *Home Care of the Sick,* and is intended primarily for courses in child hygiene and in adult education in child care, which are now being introduced in a number of our universities. The book is in the form of a compendium of information pertaining to child health and covers the period from conception through school age. It is written with a sketchy, easy style in non-technical language.

Mrs. Selbert has drawn exhaustively from the literature on child hygiene and practically every page contains one or more references. The various factors concerning child health are boiled down to lowest terms and in some places are stated with dogmatic assurance. The whole book is non-controversial even in those parts where a question might be raised regarding lack of definite scientific information.

The book opens with a bird's-eye view of the evolution of child health work, especially in the United States. The second chapter, taking up problems affecting the growth of children, sets forth briefly some of the factors which condition children's growth. An attempt is made to state the modern concepts regarding parental education and the various psychological elements which enter into relationships between parent and child. While a considerable amount of information is assembled within small compass, it seems that could a greater amount of space be given to the subject, better proportions would result.

The chapters on prenatal care and the natal period conform closely to other literature on this subject. The procedures on the whole are standard ones. The nursery school movement is traced briefly and the development of the nursery school in America is outlined. The chapter on the school child and the adolescent presents material gleaned from diverse sources. The effect of child labor on the child is treated in a very concise but satisfactory manner, and a chapter devoted to the use of leisure time and health camps is very applicable at present when we are seeking to build better health standards for summer camps.

The book contains a wealth of illustrations bearing upon the various subjects under consideration. In other words, this book is a condensation of present knowledge on child hygiene, written in non-technical language, and accessible for ready reference. It does not pretend to offer original investigation or take up controversial matters. It should be of value in conducting informal health education, and serve as a reference book for classes in child hygiene.

RICHARD A. BOLT

Proceedings of the Fourth Annual Conference Maryland Water and Sewerage Association, Hagerstown, Maryland, May 13 and 14, 1930. 120 pp.

This publication, which is prepared in good style and includes a number of interesting illustrations, covers a variety of subjects. Garbage and refuse collection and the reclamation and disposal of trash; sewage treatment problems, and various phases of water procurement and purification are covered.

ARTHUR P. MILLER

Nervenärztliche Gutachtertätigkeit. Dargestellt für die praktizierenden Arzte—*By Dr. Max Serog* (*Leipzig, Georg Thieme*), 1931. 60 pp. Price, M. 3.60.

This booklet treats mainly of neuroses due to trauma of the peripheral and central nervous system. It discusses the basic principles involved in the handling of such cases, and notes their relations to accident and health insurance. Numerous examples drawn from a wide experience clarify and illuminate the discussion. Cases arising in the course of military service in the World War are treated in a special chapter. The psychiatric aspects of the subject are only briefly discussed. C. A. KOFOID

Therapeutic Uses of Infra-red Rays—*By W. Annandale Troup, M.C., M.B., Ch.B. London: The Actinic Press, Ltd.*, 1930. Price in U. S. A., $1.50.

This is said to be the first book published in Britain devoted specifically to therapeutic use of infra-red rays. It appears to be based upon the experience of the author in his own practice but includes frequent references to the rather scarce literature on this application of heliotherapy.

Certain statements which are unsupported by evidence or reference are likely to be questioned by one conversant with the general laws of optical physics, for instance, "The depressing effects of the tropics . . . have been attributed to infra-red rays . . . the ultra-violet rays are practically entirely absorbed by water vapor. . . ." It is generally accepted that water *per se* does not offer serious interference with ultra-violet transmission, and also that energy from $\lambda 14000$ to $\lambda 80000$ is practically entirely absorbed by even 1 inch of water.

The suggestions made of the mutual assistance or interference of ultra-violet and infra-red seem to have an empirical basis not entirely in accord with all published data.

In the main it appears that the scientific facts are soundly set forth. As to therapeutic practices, these are to be judged in the light of results obtained until more basic knowledge of fundamental facts as to the cause of these can be worked out.

The book should serve as a useful guide to the practitioner, who will, in all probability, pursue a course of trial and observation, rather than follow literally exact procedures recommended.

Quoting from the foreword by Sir William Wilcox, ". . . the use of infra-red irradiation by medical practitioners will prove a really useful . . . form of clinical research."

JOHN W. M. BUNKER

Handbuch der Tropenkrankheiten—*herausgegeben von Prof. Dr. Karl Mense. Ed. 3* (*Leipzig, Verlag von J. A. Barth*), *Johann Ambrosius Barth, Leipzig C 1, Germany*, 1929. Teil 1, 846 pp., 362 figs.; Teil 2, 847–1418 pp., figs. 363–556. Rm. 90.–

The fifth volume of this well known and much appreciated treatise on tropical medicine has now been published. It is of prime interest, because of the inclusion of helminth diseases, relapsing fever, and other spirochetoses, Chagas' disease, and yellow fever, and the protozoan parasites of the blood of vertebrates.

The general section deals with the distribution and favoring conditions for the various helminth infections of man, such as ascaridiasis, oxyuriasis, trichocephaliasis, ankylostomiasis, dracontiasis, filariasis, trichinosis, schistosomiasis, and the principal cestodes of man. Accessory and intermediate hosts, and vectors of the helminths of man, the distribution throughout the world and among different peoples, of the parasitic worms, the clinical signs of helminth infection, the action of the worms on the

host, helminth plagues and diseases, the detection and differentiation of worm infections by fecal examination and culture, by the radioscope, and by immune reactions, and the treatment and prevention of helminth diseases are summarized. In the special section each important parasite receives detailed discussion.

The spirochetoses receive an extended discussion of 250 pages at the hand of Dr. H. Ruge of Hamburg.

Dr. Carlos Chagas of Rio Janeiro, assisted by Dr. Villela and Dr. Rocha-Lima, brings the subject of American trypanosomiasis up to date, noting especially the cardiac and neurotropic aspects of the infection and the disease. The armadillo is the reservoir mammal and Triatoma, a kissing bug, the insect vector.

The chapter on yellow fever is of especial interest to American readers, not only because of the repeated invasions of " Yellow Jack " into the United States, and because of the extensive quarantine system in vogue against it, but primarily because of the contributions of the late Dr. Noguchi to its solution. The bibliography contains 33 articles from his pen. They cite the difficulties in the way of accepting Noguchi's *Leptospira icteroides* as the etiological factor, and the conclusion is reached that the Brazilian and the African yellow fevers are identical. Investigators are not absolved from continuing the Noguchi hypothesis within the scope of further investigation, though they appear to be unconvinced of its correctness.

Part two of the fifth volume of this monumental treatise on tropical medicine is given over wholly to the protozoan parasites of the blood of vertebrates. The treatment of malaria and of the species of Plasmodium afflicting man is found elsewhere in the third volume. The species of this genus occurring in other vertebrates are, however, included here with the other Hemosporidia.

Professor R. Kudicke of Canton, China, is the author of this section of the work, with the exception of the part dealing with African sleeping sickness, which is written by Professor Carl Mense, the general editor of the entire work.

The invasion of the blood stream by the Protozoa occurs throughout all of the classes of vertebrates, but is best known among land vertebrates, perhaps in part because of ecological considerations, but on biological grounds because of the access of blood-feeding Arthropoda. Thus in this phylum several families, many genera, and still more species, are vectors of blood flagellates or Sporozoa. Thus the mosquitoes (*Culicidae*) carry Plasmodium, Laverania, Proteosoma, and Trypanosoma; the horse flies (*Tabanidae*) and tsetse flies (*Glossina*) carry Trypanosoma; louse flies (*Hippoboscidae*) carry Trypanosoma, Hemoproteus, and Leucocytozoon; the sand flies (*Phlebotomus*) carry Leishmania; the fleas (*Aphaniptera*) carry Trypanosoma, and the *Hemiptera* (*Triatoma* or kissing bugs) carry Trypanosoma and Schizotrypanum. Among the Arachnoidea the ticks (*Ixodidae*) carry Babesia, Nuttallia, Theileria, and Hepatozoon; and the mites (*Gamasidae*) carry Karyolysus, Schellackia, and Hepatozoon. Among fishes and amphibians the leeches are vectors of Trypanosoma, Trypanoplasmus, and Hemogregarina.

This imposing list is indicative of the extent to which the evolution of blood feeding insects, arachnoids, and leeches has been attended by the evolution of protozoan blood parasites. The presence of flagellate and sporozoan parasites in the digestive tracts of non-hematophagous insects, arachnoids, and leeches suggests the derivation of the invaders of the blood stream of vertebrates from the less specialized parasites

in the digestive tract of these invertebrate hosts.

Dr. Kudicke writes of the blood flagellates. He gives an extended account of the pathogenic and nonpathogenic trypanosomes of mammals. The author is conservative in most matters of terminology and nomenclature. Thus he retains blepharoplast for the structure in the Trypanosomidae which most protozoölogists, following the interpretation of the reviewer, are now calling the parabasal body. He also adheres to the old name Lamblia instead of Giardia, which clearly has nomenclatural priority and now has wide usage in all leading treatises on protozoölogy.

The subject of African human sleeping sickness is treated by Dr. Mense. He discusses the remarkable history of this dread plague of tropical Africa, tracing it from the Hebrew records to its present flare along streams and shores of lakes from Senegal into Angola, and from the Soudan into Rhodesia. It varies considerably in virulence, in intensity of infection, and in the resulting mortality. Treatments by arsenicals, including the tryparsamid and the German 205, or germanin, are not certainly successful and often fail in advanced cases of the disease. But the victim of this dread infection need not in the early stage, as formerly, look forward to a fatal termination.

The author holds as inconclusive the evidence that the wild game of Africa is widely infected with the human trypanosome, and refrains from advising its extermination as a protection to man in endemic areas of trypanosomiasis.

The volume is notable in scope and treatment, and maintains the well known high standard of illustration, documentation, editorial coördination, and scholarly thoroughness which has always characterized this work under the capable leadership of the veteran investigator of tropical diseases, Professor Dr. Carl Mense. It is a fine contribution to this active field of medical investigation. C. A. KOFOID

Personal and Public Health—*By Burkard, Chambers and Maroney. New York: Lyons and Carnahan,* 1930. 516 pp. Price, $1.08.

This text, intended for junior high schools, uses the very logical but rarely found method of presenting the closely related personal health facts in closely related style. This is the outstandingly good feature of the book. As a result the chapter on The Muscular System, for example, includes the related facts of anatomy, physiology, nutrition, general hygiene, safety, and first aid; that on Teeth, their structure and development, the importance of diet in relation to fine sound teeth, personal and dental care; and teeth as focuses of infection. The use of more than 4 pages for presenting various methods for brushing the teeth rather spoils the emphasis on the relation of nutrition to fine teeth, and raises a question as to the confidence of the authors in the effectiveness of the health habit material presented in the first books of their series.

The community health facts are presented in such a way that the more abstract ones relating to federal and state precede the more concrete home, school, and local community health facts. The suggestions for Health Habit Formation are practical but any challenge to the pupils will have to be supplied by the teacher or the children themselves.

The mechanics of the book leave something to be desired from a health standpoint since the various sizes of type break up the pages in a way to irritate even the untrained eyes of a child. The English also leaves something to be desired in that the almost constant use of simple sentences is

monotonous; for example, "The arms and legs are joined so that they act as levers," and "There are four curves in the spinal column as viewed from the side." MARY L. HAHN

Health and Life—*Consultations with Eminent Doctors. Edited by Morris Fishbein, M.D. Chicago: Manning Publ. Co.*, 1931. Set of 8 volumes. Price, $4.00, $.50 each.

Here is a new series of attractive little books on health, written by eminent physicians in conversational style so as to appeal to a wide popular audience. These should prove helpful on the table in the waiting room of the busy practitioner. They should also find a place in the hands of teachers, nurses, and health educators.

They will do much to strengthen the growing opinion that physicians are instructors in health as well as in curing disease, and that they are glad to take the public into their confidence on all important matters concerning personal hygiene.

Incidentally, these volumes will act as an antidote to much of the hurried, ill-digested and erroneous material put out in the name of health education at the present time.

It is not possible to give consideration to each individual volume. The soundness of the content is guaranteed by the reliability of the authors of each chapter. RICHARD A. BOLT

An Exhibition Handbook—*By Randall D. Warden. New York: Barnes*, 1929. 107 pp. Price, $1.00.

The first thing to recommend this book is its practical usefulness to any department of physical education. The public is usually entertained by well presented exhibitions of this type. The Handbook sets forth a program for such an exhibition together with detailed directions for putting it on. In addition to being an interesting program it will give any school patron a very good idea of the sort of work the department is doing. Free exercises, those demanding a fair equipment of apparatus, tumbling, and dancing, make it possible to give every group a chance to display its proficiency. The last pages are given over to an out-of-door festival with full directions for its presentation. LENNA L. MEANES

Wholesome Living Series: Health and Happiness; Health and the Rules of the Game; Health and Control; Health and Service—*By Jesse Feiring Williams and Theresa Dansdill.*

Health and Ideals—*By Jesse Feiring Williams. Boston: Benj. H. Sanborn & Co.*, 1930–1931. Price, $.64, $.64, $.68, $.72, and $.80.

In this series for textbook use in public schools from the 3d grade up to and through junior high, the subject of health, as the title indicates, is treated as a trinity of physical, mental, and social well-being. No part of this trinity can be at its best without the best of health in all three. Health education therefore becomes, not just a matter of instruction in hygiene—or not of that plus instruction in public health measures—but rather a matter of correlating health with all life. The rules of the health game are made imperative in playing the whole game of living with one's group—living it as the boy or girl wants to live it as a well trained, fit member, able to take his own part, able now and then to lead.

The first of the series—for use in the 3d grade—called *Health and Happiness*, and the second—*Health and the Rules of the Game*—for 4th grade, are both collections of attractive stories for children, each introducing some simple but vital phase of health activity and nailing the lesson down by questions supposed to be asked by a child of the story and really asked by a group of

children in trying out the material for use in the book. These two of the five are illustrated in color by Alexander Key.

Health and Control and *Health and Service* follow for the 5th and 6th grades. These are more formal in plan, taking on chapters and general textbook arrangement, but show a skillful handling so that facts in health living are made live, vital, to be used in making oneself a desirable member of a group. Illustrated in black and white.

Health and Ideals is planned as a text for 7th and 8th grades; particularly its manner of presenting the physiological material—really very comprehensive and technical—is adapted to appeal to the motives common to adolescents, ranking high among which is the desire to be well trained like the athlete of the school, to be a good fellow in playing the game, and to be fit to meet any great adventure that may come along. Technical drawings by T. M. Stell, others by Alexander Key.

LENNA L. MEANES

Practical Massage and Corrective Exercises with Applied Anatomy—*By Hartvig Nissen. Boston: Davis,* 1929. 271 pp. Price, $2.50.

As student, teacher, and masseur from the Swedish school, Nissen brings his experience and knowledge to the public in a clean-cut, practical fashion, which puts massage in its proper place in relation to all exercise. The author gives us the why and the what and the result of manipulations in the first section of his book. He follows by doing the same for corrective exercises. While by no means claiming that exercise is a cure for all ills, he does, in the last division, make an intelligent claim for it in many instances. The book is blessed with a very comprehensive table of contents and an adequate index. In addition it is well set-up so as to make its reading attractive. The 72 illustrations —half tones and line engravings—are excellent.

LENNA L. MEANES

Margarine as a Butter Substitute—*By Katharine Snodgrass. Stanford University, Calif.: Food Research Institute,* 1930. Price, $3.00.

Prepared under the Directors of the Food Research Institute, who have also contributed certain sections to it, this volume is an illuminating study of oleomargarine from its introduction to the present. The processes of manufacture are described, and the materials used mentioned and discussed. Naturally, developments in the butter industry had also to find a place, and several chapters are given to a consideration of the butter and margarine markets. The various vegetable oils, their sources, production, purification, and uses, come in for treatment. The economics of the situation are considered, and some 9 chapters are given to legislative enactments, in addition to which there are 2 appendixes which give summaries of federal and state legislation.

The volume strikes us as being an impartial and comprehensive study. This feature is brought out particularly in "Concluding Remarks," where the material is summed up under 2 heads, for margarine on the one hand, and butter on the other. It is stated clearly that there is truth in the claims of both sides. Involved in the controversy, there is also the question of vegetable oils, some, such as cotton seed, peanut and corn, produced in this country, some in our dependencies, like the Philippines, and some in foreign lands. The economic aspect is given full attention. One must read the book to get a clear idea of the complexity of the situation, and the various interests which are involved. The only persons who seem so far to have been left out of consideration are the consumers, a fact upon which the author comments.

It seems clear from the text that politics has played a large part in the controversy, and it will probably come as a surprise to many to be told that the question of independence of the Philippine Islands is involved, since at present they are able to import coconut oil free of duty, in competition with American producers who refine the oil from copra.

There are numerous charts and tables taken from governmental sources, showing relative consumption, production, export, prices, number of milch cows, and other data bearing on the matter.

The book can be thoroughly commended to all who are interested in this question, which has been discussed for many years, and has given rise to much bitterness.

The printing and make-up of the book are excellent. The author has had assistance of the Directors of the Food Research Institute, as well as a number of experts in various parts of the country.

M. P. RAVENEL

BOOKS RECEIVED

THE PRINCIPLES OF EPIDEMIOLOGY AND THE PROCESS OF INFECTION. By C. O. Stallybrass. New York: Macmillan, 1931. 696 pp. Price, $8.50.

PREVENTION OF DISEASE IN THE COMMUNITY. By Curtis M. Hilliard. New York: McGraw-Hill, 1931. 193 pp. Price, $1.75.

CANCER AND SCIENTIFIC RESEARCH. By Barbara Holmes. New York: Macmillan, 1931. 160 pp. Price, $1.50.

MOTHER ALPHONSA. By James J. Walsh. New York: Macmillan, 1930. 275 pp. Price, $2.25.

DIFFERENTIAL MORTALITY IN TENNESSEE. By Elbridge Sibley. Nashville: Fisk University Press, 1930. 152 pp. Price, $2.50.

LABORATORY DIAGNOSIS. By Edwin E. Osgood and Howard D. Haskins. Philadelphia: Blakiston, 1931. 475 pp. Price, $5.00.

STUDIES FROM THE DELAMAR INSTITUTE OF PUBLIC HEALTH. Columbia University Reprints, 1928–1930. Vol. IV. New York: Delamar Institute of Public Health, Columbia University, 1931. 560 pp.

FACTS AND FIGURES ABOUT TUBERCULOSIS. Compiled by Jessamine S. Whitney. New York: National Tuberculosis Association, 1931. 63 pp. Price, $.75 paper cover, $1.00 flexible fabrikoid.

FARM CHILDREN. An Investigation of Rural Child Life in Selected Areas of Iowa. New York: Appleton, 1930. 337 pp. Price, $4.00.

PRACTICAL DIETETICS, WITH REFERENCE TO DIET IN HEALTH AND DISEASE. 18th Ed. Mount Vernon, N. Y.: Pattee, 1931. 856 pp. Price, $2.75.

SOME BITING REMARKS FOR THOSE WHO ARE CONSTANTLY HUNGRY. By Happy Goldsmith. New York: Barnes, 1931. 43 pp. Price, $.75.

SAFETY EDUCATION. By Idabelle Stevenson. New York: Barnes, 1931. 157 pp. Price, $1.00.

WHITE HOUSE CONFERENCE: 1930. Addresses and Abstracts of Committee Reports. Prepared by the White House Conference on Child Health and Protection. New York: Century, 1931. 372 pp. Cloth, $2.00; Boards, $.50.

THE SIGHT SAVING REVIEW. Vol. I, No. 1, March, 1931. New York: National Society for the Prevention of Blindness, Inc., 1931. 80 pp. Subscription price, $3.00 per year.

FOOD POISONING AND FOOD-BORNE INFECTION. By Edwin Oakes Jordan. Chicago: University of Chicago Press, 1931. 286 pp. Price, $2.50.

THE VITAMINS. 2d ed. By H. C. Sherman and S. L. Smith. New York: Chemical Catalog Co., 1931. 575 pp. Price, $6.00.

PERSONAL PROBLEMS FOR MEN AND WOMEN. By Karl M. Bowman. New York: Greenberg, 1931. 279 pp. Price, $3.50.

DISCOVERING OURSELVES. A View of the Human Mind and How it Works. By Edward A. Strecker and Kenneth E. Appel. New York: Macmillan, 1931. 306 pp. Price, $3.00.

HEALTH DEPARTMENT AND OTHER REPORTS

IRA V. HISCOCK

Racine, Wis.—The 1930 report for this city of 67,515 opens with a graphic presentation of population, birth and death rate trends, followed by an organization chart of relationships of official and voluntary health activities. The central family file inaugurated by the health department in January, 1929, contains almost 13,000 records, including most of the families in the city. An infant mortality rate of 39.4 and a neonatal rate of 27.2 are recorded. The tuberculosis rate was 57.7 and the general death rate 9.8. The 1931 budget was $44,045.

Through the coöperation of various organizations, a preschool campaign resulted in the examination of 796 children, or 49 per cent of the entering group. Radio talks given by the health commissioner numbered 41. Pamphlets distributed numbered 74,719. The total number of children receiving toxin-antitoxin was 1,871, of whom 69.5 per cent were less than 5 years of age. During a 5-year campaign, 11,315 children have been thus protected. Of 5,143 children given subsequent Schick tests, 95 per cent gave negative reactions. As usual, this report abounds in enlightening statistical tables and interesting descriptive text.

Henderson County, Ky.—The personnel of the full-time unit consists of a staff of 5, to serve an area of 450 square miles with a population of 26,600 in 1930. There are 25 practising physicians in the county, 18 of whom reside at the county seat. An estimate by the County Farm Agent of the effect of the drought on crops was as follows: about 20 per cent reduction in the tobacco acreage, 70 per cent damage to corn crop, and 75 per cent damage to hay and pastures. The Public Welfare Association of Henderson received nearly 3 times as many applications for assistance in 1930 as in 1929.

There were 515 live births in the county in 1930, 82 being colored. A death rate of 12.7 is reported, based on 336 deaths. An infant mortality rate of 68 is recorded. There were 24 deaths from tuberculosis. Throughout the year, popular education through talks, bulletins and personal interviews was developed in tuberculosis control. A sign board 6′ x 8′ was constructed by the health department and placed in the court house yard, bearing in large print a message of warning against tuberculosis. From seal sale funds a tuberculosis hut, 8′ x 10′, was built for a male tuberculosis patient. Photographs of these activities illustrate the report.

The major part of the health department work was devoted to school hygiene. A Blue Ribbon campaign was inaugurated, culminating in a May Day celebration. During the year 1,921 physical defects of school children were known to have been corrected.

Pennsylvania—The 1929 Year Book indicates for the state a birth rate of 19.1 and a death rate of 11.9. The typhoid death rate of 1928 was 2.0, indicating a continuous decrease over a period of years due in large measure to the safeguarding of public water and milk supplies. The diphtheria rate in 1929 of 6.8 is the lowest recorded. The tuberculosis death rate was 63, a reduction from 151 in 1906. Detailed statistical tables are submitted by counties, and several graphs indicate mortality trends.

A system of cross-checking of fatal reportable diseases begun in 1926 led to measures which stimulated the reporting of cases. During the past 8 years the department has supplied sufficient

diphtheria toxin-antitoxin to protect over 800,000 children. "Pennsylvania has a vaccinated population, thanks to the beneficient action of the Legislature in passing a law requiring the vaccination of school children."

The bureau of milk control promotes the distribution of a clean, safe public supply and an increase in milk consumption. State department activities include farm inspections (2,020), plant inspections (483), and special tests. The state is divided into 8 districts for supervision purposes and the control officers live in their respective areas.

The bureau of child health, organized in 1923, brings under one administrative head the preschool, school, and dental work of the department. The school division reports 269,161 pupils examined and 199,821 pupils advised on treatment during the last school year. During the summer months, motor units were sent into the rural sections for the examination of infants and preschool children.

Detroit, Mich.—The January issue of *City Health* is devoted to the annual report of 99 pages under the title "1930 Our Healthiest Year." Excellent graphs, photographs and statistical tables accompany enlightening descriptive text.

Among the outstanding points of health interest listed are a death rate of 9.2, an infant mortality rate of 65.3 as compared with 104.2 in 1920, an increase in hospital beds for tuberculosis to 2,088, a tuberculosis death rate of 82.5, the immunization of 57,000 children against diphtheria by the private physicians of the city, and a reduction in the diphtheria death rate to 10.9, or one-half of the 1929 rate. A series of weekly clinical conferences on communicable diseases was held at the Herman Kiefer Hospital under the auspices of the public health committee of the Wayne County Medical Society. The average attendance exceeded 225 physicians.

The department of health personnel of 1,834 is given in a classified table according to functions. A financial tabulation shows gross expenditures of $3,962,870, with credits of $1,825,000. Preventive medical service expenditures amounted to $1,585,230 in this city of 1,585,653 population.

The milk inspection division pictures the monthly milk supply in terms of a lake of milk 2½ feet deep, ½ mile long, and over 100 yards wide, weighing over 30 million pounds. Milk supervision is organized from the point of production to the time of delivery. There are 14,600 farms, 30 pasteurizing plants, the former receiving 17,880 inspections and the latter 4,473 inspections during the year.

All food handlers must possess an annual card issued by the department of health, indicating that they have had, during the year, a complete physical examination. Such examination may be made by any reputable licensed physician or by the department. As a means of making the physical examination of more personal value to the individual, all food handlers appearing for examination at clinic are given elementary talks on personal hygiene while they are waiting for examination. In 1930, 13,818 examinations were given, of which 8,448 were by private physicians.

The child health service of the department of health was previously reviewed in this column. The Board of Health has described the educational functions of the public health nurse as follows: (*a*) prevention of illness; (*b*) measures to be carried out to secure the alleviation of sickness; (*c*) social service matters which involve proper hygiene in the home—this may involve such budgetary management of income that the nutritional requirements of the family may be adequate; (*d*) child hygiene; (*e*)

applied psychology; (*f*) a knowledge of welfare agencies which are available, together with the aid they can render; (*g*) a sound theory and practice of rest, exercise, food, rainment, cleanliness, and how inciting agents are spread; (*h*) laws, regulations, and procedures for preserving the public health. With these functions in mind, the board has set up qualifications for the nurses of the department.

Winona, Minn.—Pasteurization is required of all milk sold in this city. Coöperation between milk producers, distributors, and the department of health has resulted in the stabilization of milk prices. The producers receive 60 per cent of the retail price and the distributors 40 per cent. Milk purchased from the producers is on a flat rate, the minimum butter fat content being 3.5 per cent. The consumer pays 11 cents a quart for standard milk equivalent to Grade A pasteurized, which is produced from cows tuberculin tested annually under the federal and state accredited herd plan and physically examined quarterly.

This city, with a population of 35,144, reports for 1930, 241 deaths, 429 births (265 in hospital, 15 attended by midwives), with 16 deaths under 1 year of age. The average length of life of residents, excluding infant deaths, was 60 years. There were 7 deaths from tuberculosis, with no deaths from diphtheria. Attendance at infant welfare clinics numbered 1,522, while home visits totalled 1,678. This report of 22 pages is written in a popular style worthy of commendation.

Palo Alto, Calif.—Palo Alto's annual report for 1930 was off the press on February 28—an excellent record. To be of greatest usefulness, early publication of annual reports is desirable. On the basis of a population of 13,800, a death rate of 9.6 is recorded. Eight of the 15 deaths from tuberculosis recorded were of persons over 63 years of age. The infant mortality rate was 39.2, as compared with 41.3 for the preceding 10-year period. There were 37.6 cases of communicable diseases reported per 1,000 population.

Milk consumption has reached 1.2 pints per capita. Two surprise milk tests were made of the local milk supply by representatives of the State Department of Agriculture, and a general average score of 97.8 was obtained. Palo Alto received honorable mention in the 1929 health conservation contest of the U. S. Chamber of Commerce. There have been no deaths in the city from diphtheria since 1921. Active immunization was carried on as in former years, 420 children having been protected by local physicians and the health department.

Steubenville, O.—A vaccination campaign in 1930 resulted in the vaccination of 1,156 persons, including 29 adults. A subsequent survey showed 66 per cent of the 7,360 school children protected. There was 1 case of smallpox during the year. At the preschool clinic there was an attendance of 167. Of 2,766 school children Schick tested, 1,128 were found to be susceptible to diphtheria and 500 of these were immunized. The immunization campaigns were conducted with the coöperation of the local medical association.

The milk supply is obtained from 490 dairy farms in 5 adjoining counties. Pasteurization safeguards 85 per cent of the supply. Inspections are made of farms and pasteurizing plants. A modern milk ordinance was passed in 1929.

Vancouver (B. C.) Hospital Survey—A comprehensive report has been issued by the Vancouver hospital survey commission upon the hospital situation of greater Vancouver, conducted under the auspices of a joint committee

of the city council, the hospital board of directors, and the provincial government of British Columbia. The report is of 220 pages with 8 chapters and an appendix. Several charts and a topographical map add interest to the report, which deals with public health and welfare activities, as well as hospitals.

A metropolitan hospital plan is suggested, which includes the organization of a central laboratory for all institutions, with a small subsidiary laboratory in each hospital. It is suggested that the laboratory work of the health department be conducted in this central laboratory as at present. The commission favored the complete separation of all medical functions from the city relief department and their transfer to the outpatient department of the general hospital. It further suggests that the relief department under the direction of an experienced sociologist, confine its activities to material relief, unemployment, and community sociological projects.

A staff qualifications committee is proposed as an aid in selecting competent physicians for the hospitals. Two complete but separate attending staffs are suggested, each serving for a period of 6 months. By this time, it would be possible to compare each department with the corresponding department on the other service; it would also offer a wider opportunity to the medical profession, and the burden of charity work would not fall too heavily upon the shoulders of a small group.

It is suggested that private hospitals be placed under the inspectorial supervision of a Metropolitan Hospital Board, and that all future expansion programs be subject to the approval of that body. It is also recommended that the licensing of private, commercial hospitals be delegated to the proposed Director General of Hospitals of the Metropolitan Board. Fundamental standards for the conduct of an outpatient department are outlined. Emphasis is placed upon the need for a first class social service department staffed with experienced and well trained workers. A new institution is suggested for the care of chronic and convalescent cases.

Iowa—The biennial report for the period ending June 30, 1930, shows that the state-wide diphtheria immunization campaign has resulted in the protection of about two-thirds of the school children. Credit is given to the protection thus conferred for the reduction in deaths from a yearly average of 242 for the period preceding the campaign (1923) to 34 for the year 1929. There were 4,969 cases of smallpox reported, causing a calculated loss of time through quarantine of 382 years. The tuberculosis death rate in 1929 was 33. The epidemiologist's report contains a detailed account of severe epidemiological investigations of interest.

Considerable public health education work has been done. More than 200 letters and 2,500 pieces of second class mail leave the department daily, and a weekly health message on timely subjects is published. The health message topics are widely copied by newspapers throughout the state.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH. D.

Antiseptic Standards—Justly critical of the old methods of evaluating antiseptics, a new and complete survey of antiseptic qualities is advocated.

ALLEN, A. W., and WRIGHT, I. S. Determination of the Value of Antiseptics, J. A. M. A., 96, 12: 920 (Mar. 21), 1931.

Coal Miners' Lungs—A radiographic study of industrially healthy miners reveals extensive lung alterations which represent a definite impairment of lung structure and function, yet are consistent with working health.

ANON. Coal Miners' Lungs, J. Indust. Hyg., 13, 1: 19 (Jan.), 1931.

Public Health Law Fundamentals—Adequately described in the title. Good for the soul of the law enforcing officer.

BAUMAN, J. E. The Fundamentals of Public Health Law, Pub. Health Rep., 46, 12: 631 (Mar. 20), 1931.

National Diets—This scholarly dissertation on diet goes deeper than calories of carbohydrates and proteins and considers the more fundamental and potent factors that influence the national dietary.

CATHCART, E. P. The Foundations of a National Diet, Med. Off., 45, 12: 131 (Mar. 21), 1931.

The Future Physician—"Within certain limits, therefore, the physician of the future will be able to control the growth of the body and the development of the mind. He will acquire such a knowledge of biochemical and biophysical processes that he will be able to guide his fellow men as an engineer of living processes."

CRILE, G. W. The Medicine of the Future, New York State J. Med., 31, 5: 272 (Mar. 1), 1931.

Tolerance to Staphylococcus "Poisoning"—Human subjects fed increasing doses of staphylococcus filtrates developed some tolerance to "food poisoning" produced by the strain.

DACK, G. M. Attempts to Immunize Human Volunteers with Staphylococcus Filtrates that are Toxic to Man when Swallowed, J. Prev. Med., 5, 2: 151 (Mar.), 1931.

Progress of Clinics—The tendency of clinics to expand in number and scope and to become centers of medical service rather than charitable enterprises leaves many problems for the medical profession to solve. The discussion of these problems becomes a most interesting paper.

DAVIS, M. M. What the Public Has a Right to Expect of Clinics, New Eng. J. Med., 204, 12: 604 (Mar. 19), 1931.

Fostering the Unfit?—An eloquent answer to the dimwit who cries out against our modern health measures on the ground that we are fostering the weakling.

EMERSON, H. Are We Fostering the Unfit? Survey Graphic, 46, 1: 49 (Apr.), 1931.

White House Conference Continued—The final session of the President's Conference on Child Health so rich in fact finding, but about which there was so little public acclaim, is briefly summarized.

EMERSON, H. The Child Takes the Lead, Survey, 65, 12: 649 (Mar. 15), 1931.

Epidemic Poliomyelitis—In readily understandable form, this excellent statement of the present status of our knowl-

edge of poliomyelitis is a good example of "how it should be told."

HEKTOEN, L. Infantile Paralysis, Pub. Health Nurse, 23, 3: 114 (Mar.), 1931.

Tonsils, Adenoids and Infections—A 10-year study of 4,400 controlled children indicates that removal of tonsils and adenoids favorably influences the incidence of colds, sore throats, rheumatic fever, diphtheria, scarlet fever, nephritis. Chorea, measles, laryngitis and tuberculosis seemed to be improved to a slight degree. But bronchitis, pneumonia and sinusitis were influenced unfavorably.

KAISER, A. D. The Relation of Tonsils and Adenoids to Infections in Children, Am. J. Dis. Child., 41, 3: 568 (Mar.), 1931.

Telling Dear Public—One of the best examples we have seen of a story about health work by a practising sanitarian. If more of them would go and do likewise, many more people would know what public health really is.

LAYBOURN, R. L. Laboratory Specimens, Survey Graphic, 65, 11: 607 (Mar. 1), 1931.

State Health Survey—This survey of the health administration needs of Oklahoma contains much that may be applied to state administration generally.

MCLAUGHLIN, A. J. A Public Health Survey of Oklahoma, Pub. Health Rep., 46, 11: 575 (Mar. 13), 1931.

Tuberculosis in Children—A plea for early institutional treatment to check tuberculosis in children, to prevent the greater part of the deaths from the disease in adult life.

MCPHEDRAN, F. M. Some Aspects of Tuberculosis in Children, Brit. M. J. 3660: 342 (Feb. 28), 1931.

Venereal Disease Reporting—Approximately 1,000 physicians, or less than a third of the number who saw venereal disease patients, were responsible (with public clinics) for more than 11,000 Massachusetts case reports in 1930. The study of these reports leads to interesting conclusions.

NELSON, N. A., and SCAMMAN, C. L. Gonorrhea and Syphilis in Massachusetts in 1930, New Eng. J. Med., 204, 13: 637 (Mar. 26), 1931.

Diphtheria Toxoid—This description of the preparation and dosage of toxoid explains the probable reason for some of the conflicting reports of early experience with the product which will eventually replace toxin-antitoxin mixture for routine immunization of small children against diphtheria.

POVITZKI, O. R., *et al.* Diphtheria Toxoid, Preparation and Dosage, J. Immunol., 20, 3: 247 (Mar.), 1931.

Diagnosis of Tuberculosis—Of a group of persons applying for employment, 1.2 per cent had X-ray evidence of tuberculosis without other physical signs. More than half showed progressive disease within the year. This is a significant finding to be considered by health examination propagandists.

REID, A. C. X-ray Tuberculosis in Apparently Healthy Individuals, New York State J. Med., 31, 6: 337 (Mar. 15), 1931.

Diphtheria Mortality—Statistical evidence of what is very generally accepted: mortality increases with delay in the administration of antitoxin; rural mortality rates exceed urban, regardless of method of treatment; mortality expectancy decreases with age.

STEVENS, I. M. An Analysis of 3,122 Diphtheria Case Histories, Am. J. Hyg., 13, 2: 392 (Mar.), 1931.

Measles Diagnosis—Three aspects of measles control are discussed: the priority of fever in symptomatology; the importance of eye signs in early diagnosis; and the necessity of individual isolation.

STIMSON, P. M. Important Aspects of

Measles, New York State J. Med., 31, 6: 352 (Mar. 15), 1931.

Encephalitis Following Vaccination—Three cases of encephalitis following anti-smallpox vaccination are presented in a discussion of the differences between this condition, encephalitis lethargica, and tetanus.

VIETS, H. R., and WARREN, S. Vaccinial Encephalitis, New Eng. J. Med., 204, 10: 475 (Mar. 3), 1931.

Intradermal Typhoid Vaccination—Injections of four small doses of antityphoid vaccine intradermally are suggested on the ground that the technic is simple, the immunologic response is satisfactory, and local reaction is much reduced.

TUFT, L. Active Immunization Against Typhoid Fever, with Particular Reference to an Intradermal Method, J. Lab. & Clin. Med., 16, 6: 552 (Mar.), 1931.

Cold Vaccine—Successful but limited experience in preventing colds is reported in the prophylactic use of a vaccine comprising the more prevalent varieties of streptococci.

WALKER, I. C. Apparent Specificity Among Streptococci and the Cause of Some Failures of Mixed Streptococcus Vaccines in the Treatment of Chest Colds and Asthma, J. Lab. & Clin. Med., 16, 6: 539 (Mar.), 1931.

Mental Health—Written from other viewpoints than that of the public health officer, this series of papers still has much of interest for the sanitarian.

WILBUR, R. L., *et al.* Mental Health as a National Problem, J. A. M. A., 96, 13: 994 (Mar. 28), 1931.

Rural Health Service—There are two fundamental facts: rural areas need the same health service the city gets; many cannot pay for such services. Collective responsibility presumes state aid, which is the only escape from the dilemma. The story of Cattaraugus leads to this conclusion.

WINSLOW, C.-E. A. Carrying Health to the Country, Survey Graphic, 65, 11: 610 (Mar. 1), 1931.

Getting Group Action—Remarks anent the new leadership as a means of stimulating creative thinking in and by a group. Addressed to a visiting nurse service board meeting, this excellent paper can be read with profit by all sanitarians.

WINSLOW, C.-E. A. The New Leadership, Pub. Health Nurse, 23, 3: 108 (Mar.), 1931.

Cancer Research—Absorbing indeed is this excellently prepared and brief story of 30 years of experimental study of the cause and growth of malignant disease. A wealth of material for health workers who would become publicists.

WOGLOM, W. H. Experimental Cancer Research, Am. J. Med. Sci., 181, 2: 157 (Feb.), 1931.

NEWS FROM THE FIELD

SUMMER SCHOOL COURSES IN PUBLIC HEALTH

While the following list does not show all universities and technical schools offering summer courses in public health, it represents those who have replied to a questionnaire sent out by the American Public Health Association.

University of California, Berkeley, Calif.
June 22–August 1
- Administration of Schools of Nursing
- Elementary Epidemiology
- Elementary Public Health
- Public Health Nurse in Relation to the Community
- Responsibility of the Public Health Nurse for the Health of the Adult
- Supervision in Schools of Nursing

Columbia University—DeLamar Institute of Public Health, College of Physician and Surgeons
June 15–July 1
- School Health Supervision—Medical Inspection, Mental and Physical Education

Teachers College, New York, N. Y.
July 6–August 14
- Administration of Health Work in Schools
- Child Hygiene
- Health Care of Infants
- Health Education in Elementary Schools
- Home and Community Hygiene
- Methods of Teaching in Fresh Air Classes
- Methods of Teaching Lip-Reading
- Nutrition and Health
- Personal Hygiene
- Principles of Public Health Nursing
- Public Health Administration
- Research in Child Health
- Safety Education
- School Nursing
- Sight Saving Classes
- Supervision in Public Health Nursing
- Supervision of Health Education
- Survey of Public Health Nursing

Cornell University, Ithaca, N. Y.
July 6–August 14
- Gymnastics and Dancing
- Health Supervision of School Children
- Hygiene of the School Child and Adolescent
- Measurements of School Children
- Physical Education

Duke University, Durham, N. C.
June 12–July 22
- Materials and Methods in Health Education
- Materials and Methods of Physical Education

University of Georgia, Athens, Ga.
June 22–August 22
- Behavior Problems in Children
- Child Care and Training
- Child Development
- Child Study and Parent Education
- Development of the Young Child
- Diagnosis and Treatment of Exceptional Children
- Educational Biology
- Educational and Mental Hygiene
- Educational Hygiene
- Educational Sociology
- Health Education
- Mental and Educational Measurements
- Physiology and Health
- Play Activities
- P. T. A. and Parent Education
- Principles of Health and Recreation
- Mental Hygiene
- The Age of Adolescence
- The Age of Childhood

Harvard University, Cambridge, Mass.
July 6–August 15
- Principles and Problems of Hygiene, and Teaching Methods
- Physical Education, Theory and Practice

University of Hawaii, Honolulu, T. H.
June 29–August 7
- Health Education and Popular Health Instruction

University of Illinois, Urbana, Ill.
June 22–August 15
Health Education and Corrective Gymnastics
Organization and Supervision of Health Education in the Elementary Schools
Physical Education
School Hygiene

State University of Iowa, Iowa City, Ia.
June 8–July 7 (First Term)
July 20–August 20 (Second Term)
Administration of Physical Education and Athletics
Advanced Hygiene
Corrective and Remedial Gymnastics
Health Education Program in Elementary Schools
Hygiene
Hygiene of Swimming Pools, Gymnasiums, Camps
Institutional Nutrition
Medical Supervision of Athletics
Organization, Administration and Supervision of Public Play-Grounds
Organization, Administration and Supervision of Public Recreation
Organization, Administration and Supervision of Public School Physical Education
Principles and Methods of Physical Education
Principles of Physical Growth and Measurements
Seminar in Public Health

Johns Hopkins University, Baltimore, Md.
June 22–July 31
Elements of Hygiene and Preventive Medicine
School Hygiene

Massachusetts Institute of Technology, Cambridge, Mass.
July 6–August 14
Bacteriology
Health Education Methods
Methods of Teaching General Biology
Public Health Laboratory Methods

University of Michigan, Ann Arbor, Mich.
June 29–August 7
Administration and Organization of Public Health Nursing
Applied Nutrition
Child Hygiene
Epidemiology and Communicable Diseases
General Hygiene and Public Health
Industrial Hygiene
Medical Social Case Work
Mental Hygiene
Methods and Materials in Health Teaching
Principles of Public Health Nursing
Public Health Law and Administration
School Health Problems
Vital Statistics

Michigan State College, East Lansing, Mich.
June 2–July 31
Bacteriology
Hygiene
Medical Biology
Pathology
Physiology

University of Missouri, Columbia, Mo.
June 8–July 31
Nursing
Physical Education
School Hygiene

University of New Mexico, Albuquerque, N. M.
June 8–August 1
Educational Hygiene

New York University, New York, N. Y.
July 6–August 14
Child Hygiene
Education in Health
Health and Growth of School Children
Methods of Teaching Health
Principles of Teaching Health

Northwestern University, Evanston, Ill.
June 22–August 15
Personal Hygiene

University of Pennsylvania, Philadelphia, Pa.
July 6–August 15
Hygiene
Physical Education

Pennsylvania School of Social and Health Work, Philadelphia, Pa.
June 15–July 24
Nutrition
Public Health Nursing
School Nursing
Social Hygiene
Social Problems
Tuberculosis and Its Control

Rutgers University, New Brunswick, N. J.
June 29–August 7

First Aid
Preventive Medicine
Public Health

Stanford University, Stanford University, Calif.
June 18–August 29
Health Department Administration
Physical Education and Hygiene
Public Health Nursing

Syracuse University, Syracuse, N. Y.
July 6–August 14
Home Nursing
Hygiene

University of Virginia, University, Va.
June 22–August 1 (First Term)
August 3–September 5 (Second Term)
Biochemistry
Hygiene and Sanitation
Physical Education
Sex Character Education

University of Washington, Seattle, Wash.
June 17–July 27 (First Term)
July 27–August 27 (Second Term)
Advanced Nutrition
Bacteriology
Health Education Movement
Personal and General Hygiene
Physical Education Administration
Physical Education Methods
Principles of Physical Education
Principles of Public Health Nursing
School Hygiene
Supervision of Physical Education

Western Reserve University, Cleveland, O.
June 22–July 31
Foods and Health
Hygiene of the Child
Personal Hygiene

University of West Virginia, Morgantown, W. Va.
June 15–July 24
Health Education

University of Wisconsin, Madison, Wis.
June 29–August 7
Bacteriology
First Aid to the Injured
Supervision and Organization of Health Education
Tests and Measurements in Physical Education

PENNSYLVANIA PUBLIC HEALTH ASSOCIATION

THE Pennsylvania Public Health Association will hold its annual meeting at the Penn Harris Hotel, Harrisburg, Pa., June 18–19, 1931. Surgeon General Hugh S. Cumming has kindly consented to address the association at the dinner meeting of June 18.

FIRST BROADCAST OF HEALTH FILMS BY TELEVISION

THREE of the animated cartoons used by the Division of Public Health Education of the State Department of Health were broadcast by television through the courtesy of the De Forest Radio Company television station W2XCD, Passaic, N. J. The first film was sent out on March 30 and the other two on April 6 and 13 respectively. The hour of broadcasting in each instance was 10 P.M. The films were accompanied by appropriate music, which are synchronized with the pictures.

Sight is transmitted from station W2XCD on 2,035 kilocycles while sound is transmitted on 1,604 kilocycles. The range of the station extends beyond the Mississippi River and from the Gulf of Mexico into Canada.

This broadcast is the first known attempt in history to send health films by television.

ENDEMIC TYPHUS FEVER

A REPORT recently made public by the U. S. Public Health Service shows that there is strong evidence to indicate that fleas may be the means of transmission of endemic typhus fever from person to person or from a possible rodent reservoir to human beings. This discovery is of much importance

and may be of value in the prevention of the spread of this disease.

NATIONAL SAFETY CONGRESS

EACH year during the past 18 years there has been held, somewhere in the United States, what has been called a "National Safety Congress."

These gatherings, which have gradually grown in size until they are now among the largest and best organized congresses of the world, are visible proof of the growth and importance of what likewise has been called "The Safety Movement."

The Congress this year will be the Nineteenth Annual Safety Congress and Exposition, to be held in Pittsburgh from September 29 to October 3.

SWEDEN

NEW legislation prohibiting the employment of workers less than 18 years old in certain occupations went into effect in Sweden on January 1, 1931. According to the labor law of 1912, which is still in force, the King has the authority either to prohibit the employment of persons under 18 in certain occupations or to permit it under certain conditions.—*Sociala Meddelanden*, Stockholm, 11: 872, 1930.

ROCKY MOUNTAIN SPOTTED FEVER

A DISEASE of the Rocky Mountain spotted fever type has been identified as occurring in states in the eastern and southeastern sections of the United States. Heretofore it has been thought that it existed only in the western part of the United States, being most prevalent in the Rocky Mountain section.

NEW YORK STATE SEWAGE WORKS ASSOCIATION

THE Third Annual Meeting of the New York State Sewage Works Association was held in Albany, N. Y., March 5, 1931. At the business meeting W. P. Gyatt, Syracuse, C. A. Howell, Buffalo, and E. B. Phelps, New York, were elected to the Executive Committee in place of H. B. Cleveland, M. Cohn and G. D. Holmes, whose terms of office expired. John F. Skinner, Rochester, was elected President, and E. B. Phelps, Vice-President. A. S. Bedell, State Department of Health, Albany, was reappointed Secretary-Treasurer.

The next meeting of the association will be held in Freeport, N. Y., June 5–6, 1931.

PASTEURIZED MILK AVAILABLE IN JERUSALEM

THE pasteurization plant of the Straus Health Center in Jerusalem maintained by Hadassah, the Women's Zionist Organization of America, is now in operation. This means that a supply of milk, pasteurized under the most modern scientific conditions, is available in Jerusalem.

HOSPITAL CARE FOR NEGRO CRIPPLED CHILDREN

A NEW Duke memorial building for Negro crippled children was recently dedicated at the North Carolina Orthopedic Hospital, Gastonia. Its erection was made possible by a bequest for the purpose in the will of Benjamin N. Duke.

NOTICE OF THE WORLD FEDERATION OF EDUCATION ASSOCIATIONS CONFERENCE

THE fifth conference of the World Federation of Education Associations will be held at Denver, Colo., July 27–August 1, 1931. This organization seeks to coöperate with all organizations working for the advancement of world unity.

The Health Section, one of the many devoted to specific interests, has functioned actively in the promotion of school health programs. The meetings held at San Francisco, Calif., in 1923; Edinburgh, Scotland, in 1925; Toronto,

Ont., in 1927, and Geneva, Switzerland, in 1929, have been attended by representatives from all parts of the world and the reports issued by this section have an important place in libraries of teacher training institutions and in education and health administration offices throughout the world.

The program for the Health Section meeting at Denver is now being arranged and representatives of Latin-American countries will be heartily welcomed either as speakers or participants. All phases of the school health program will be presented and a representative audience of public health officers, doctors, nurses, physical educators, health educators, classroom teachers, home economists and other authorities is expected.

For further information address the secretary of the Health Section, Sally Lucas Jean, 200 Fifth Avenue, New York, N. Y.

HERMANN M. BIGGS MEMORIAL LECTURE

THE Memorial lectureship which bears the name of Hermann M. Biggs was founded by his widow. At first it was given under the auspices of the New York Tuberculosis and Health Association and the Medical Society of the County of New York. In 1930 it came under the aegis of The New York Academy of Medicine, and the first lecture as an Academy event will be given May 7, 1931.

The first lecture was delivered in 1925, by Dr. William H. Park, on "A survey of some broad phases of tuberculosis."

The other Biggs Memorial Lectures have been delivered by Dr. S. Lyle Cummins, in 1926, on "Clinical differences in tuberculosis"; Dr. Allen K. Krause in 1927, on "Tuberculosis and public health"; in 1928, Dr. C.-E. A. Winslow, who chose as his title "The contribution of Hermann M. Biggs to public health." Dr. John H. Stokes was the lecturer in 1929, speaking on "The syphilology of today and tomorrow."

There was no lecture in 1930 and the program for this year, under the auspices of the Academy, will have as the speaker, Dr. George H. Bigelow, Commissioner of Health of the Commonwealth of Massachusetts.

EVAPORATED MILK SENT TO DROUGHT AREA

AS stated editorially in the March issue of the *Journal*, one of the most urgent needs in the drought area has been an adequate supply of pure milk. Sanitarians will be interested and gratified to learn, therefore, that in April 10 carloads of evaporated whole milk, the equivalent of nearly 350,000 quarts, were shipped to centers in Kentucky, West Virginia, Tennessee, and Oklahoma for distribution through local chapters of the American Red Cross.

This milk was donated to the Red Cross by more than 13,000 employees of The Borden Company of New York and its affiliates, who voluntarily raised a fund to purchase this milk from their own company at cost price.

This company has also donated to the Frontier Nursing Service of Kentucky about 1,000 pounds of powdered skim milk for relief purposes. This product is the equivalent of about 5,000 quarts of reliquefied skim milk.

PROGRESS IN DISEASE PREVENTION

ACCORDING to the U. S. Public Health Service, the most significant advances in public health achievement have been manifested among the lower age groups. The great sanitary reforms, such as the filtration of water supplies, have remarkably diminished diseases of certain kinds among all ages and classes of persons, but the actual saving of life has been most pronounced among children, and especially little children and infants. It is for this reason that the expectation of life at

birth—that is, the average length of time that all children born at a given time will live—has increased from about 48 to about 58 years in the past 20 years.

CHRONIC SICKNESS COSTS 100 MILLION A YEAR

AT least 2 per cent of the population in New York City is constantly ill, and at least 70,000 persons in New York are continuously ill from chronic disease. Dr. Williams estimated that these individuals could ordinarily earn $45,000,000 a year, and that it cost at least $50,000,000 a year to care for them, so that the actual loss to the community on account of chronic illness was very close to $100,000,000 a year.

ENGLISH SUMMER COURSES IN PARIS

THE Faculty of Medicine of Paris (the Medical School of the University) announces a series of postgraduate courses to be given in Paris, under the auspices of the Association for the Development of Medical Relations, a commission sponsored by the French Government. The work will be presented in the English language. Clinics, lectures and demonstrations will be conducted in the great hospitals of Paris, on a wide variety of topics, by eminent French clinicians. A nominal fee will be charged for each course.

Details may be secured by addressing directly Professor E. Hartmann, President of the "A. D. R. M.," Faculty of Medicine of Paris, 12, Rue de l'Ecole de Medicine, Paris (6e); or, in the United States, Dr. Frank Smithies, 920 North Michigan Avenue, Chicago, Ill.

FORMATION OF NEW SECTION OF THE CANADIAN PUBLIC HEALTH ASSOCIATION

FOR a number of years the need has been felt for a definite section of the association to be devoted to Public Health Engineering. As a result of the expressed desire of a large and very representative group of engineers, the association has approved of the formation of this new section.

For the first year the officers of the association are as follows: *Honorary Chairman,* W. J. Bell, M.B., Deputy Minister of Health, Ontario; *Chairman,* George H. Ferguson, Dept. of Pensions and National Health, Ottawa; *Vice-Chairman and Secretary,* Albert E. Berry, C.E., Ph.D., Parliament Bldgs., Toronto. The plans for the Section including details of membership and appointment of committees will be presented at the first meeting of the Section, which will be held at Regina in June in the course of the annual meeting of the association.

There is every reason to believe that the new Section will prove a source of real strength to the association in its work of advancing public health in Canada.

PENNSYLVANIA'S RURAL HEALTH BUSES

THE Pennsylvania Department of Health, for six successive years, has sent to the rural sections of the state, motor cars fully equipped for the health examination of infants and young children. During the summer of 1930 it sent 2 cars to certain counties in the eastern part of the state, each car having a staff of 2 physicians, 2 dental hygienists, and 2 nurses. The cars were driven by medical students specially trained to give vision tests to 5 and 6 year old children. Over 8,000 children were examined, and 3,426 were referred for treatment to the family physician. Between 6,000 and 7,000 children had their teeth cleaned, and over 4,000 were recommended for treatment to local dentists.

PREVENTION AND CONTROL OF VENEREAL DISEASES

DURING the fiscal year 1930, state health authorities reported to the

U. S. Public Health Service 213,309 cases of syphilis and 155,875 cases of gonorrhea. The total of venereal infections thus reported exceeded the number of cases recorded during the calendar year for any other single communicable disease, omniprevalent measles not excepted. Data obtained from prevalence studies which have been made up to the present time appear to show that the incidence of syphilis and gonorrhea in the United States probably is much higher than that indicated by the state reports.

Estimates worked out from the results of these surveys place the probable number of new infections for which treatment is sought during the course of a year at more than 1,000,000.

PURCHASE OF HAMILTON LABORATORY BY THE GOVERNMENT

FEDERAL purchase of the tick fever laboratory at Hamilton, Mont., has been authorized by Congress. This carries an appropriation for enlarging the building. It is expected this laboratory will be considered the western branch of the National Health Institute. The passage of this bill was a direct result of the splendid teamwork of the various health agencies of the country.

PERSONALS

ROBERT ALSTON MARTIN, M.D., Fellow of the A. P. H. A., for 32 years Health Officer of the City of Petersburg, Va., died April 1, 1931.

DR. FRANCIS M. MCCALLUM, of Kansas City, Mo., was elected president of the Missouri State Board of Health, January 26; Dr. Horace W. Carle, of St. Joseph, was elected vice-president; and Dr. James Stewart, of Jefferson City, secretary, was re-elected.

DR. GEORGE K. PRATT, of New York City, a nationally known psychiatrist, has been appointed Medical Director of the Mental Hygiene Committee of the State Charities Aid Association. Dr. Pratt, who, for the past six years, has been the Assistant Medical Director of the National Committee for Mental Hygiene, will serve in this new position on a part-time basis, and will also actively continue his staff connection with the National Committee.

ANNA GARLIN SPENCER, educator, author, theologian, humanitarian, social worker, and advocate of world peace, died February 12, 1931, at her home in New York. Dr. Spencer was Vice-President of the American Social Hygiene Association.

WILLIAM A. HAMANN, after almost half a century in the chemical manufacturing industry, recently retired as chairman and director of the Roessler & Hasslacher Chemical Co., Inc., New York, N. Y.

CONFERENCES

May 5–6, National Conference on College Hygiene, University of Syracuse, Syracuse, N. Y.

May 11–14, National Tuberculosis Association, Syracuse, N. Y.

May 28–30, Western Branch, American Public Health Association, Seattle, Wash.

June 1, New York State Association of Public Health Laboratories, Syracuse, N. Y.

June 1–4, American Federation of Or-

ganizations for the Hard of Hearing, Inc., Chicago, Ill.

June 1–5, Psychiatric Association, Toronto, Can.

June 5–6, New York State Sewage Works Association, Freeport, N. Y.

June 5–8, American Association of Industrial Physicians and Surgeons, Philadelphia, Pa.

June 8–12, The American Medical Association, Philadelphia, Pa.

June 8–14, International Hospital Congress, Vienna, Austria.

June 14–20, National Conference of Social Work, Minneapolis, Minn.

June 18–19, Pennsylvania Public Health Association, Harrisburg, Pa.

June 29–July 1, New York State Conference of Health Officers and Public Health Nurses, Saratoga Springs, N. Y.

July 27–August 2, The World Federation of Education Associations, Denver, Colo.

July 26–31, Third Congress of the Pan American Medical Association, held under the auspices of the Mexican Government, City of Mexico, Mexico.

September 14–17, Sixtieth Annual Meeting, American Public Health Association, Montreal, Canada.

September 29–October 3, Nineteenth Annual Safety Congress and Exposition, Pittsburgh, Pa.

July, 1932, The Second International Conference of Social Work, Frankfurt, Germany.

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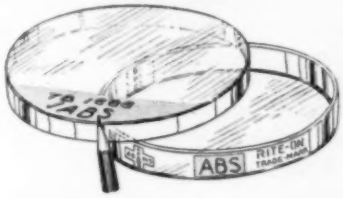

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